

**THIS MEETING IS NOT BEING LIVE-STREAMED AND ACCESS BY PHONE IS NOT AVAILABLE**

Board of Education Special Meeting  
June 6, 2023

Reed School Library  
6:30 p.m.

*As citizens of our community, we will conduct ourselves in accordance with Newtown's Core Character Attributes as displayed in our character tree. We will be responsible for our actions and show respect for each other. We will interact peacefully, productively, and politely. We will be trustworthy and honest and show compassion toward others. Newtown's continued success is contingent upon our ability to persevere, to follow through with our commitments, and to stay focused on the greater good.*

**A G E N D A**

- Item 1 PLEDGE OF ALLEGIANCE  
Item 2 CELEBRATION OF EXCELLENCE
- Top 5% of the 2023 NHS Graduating Class
  - CABE Student Leadership Awards
  - Retiree Recognition
- Item 3 CONSENT AGENDA
- Correspondence Report
- Item 4 \*\*PUBLIC PARTICIPATION  
Item 5 REPORTS
- Chair Report
  - Superintendent's Report
  - Committee Reports
  - Student Representatives Report
- Item 6 PRESENTATIONS
- First Read of Grade 7 and 8 Kitchen Science Curriculum
  - DEI Update
  - Strategic Plan Update
- Item 7 OLD BUSINESS
- Second Read of Policy 4-301 Appointment and Duties of School Medical Adviser – to be rescinded
  - Second Read of Policy 4215.1 Evaluation of School Nurses
- Item 8 NEW BUSINESS
- Discussion and Possible Action on Newtown Federation of Educational Personnel Contract July 1, 2023 to June 30, 2026
  - Discussion and Possible Action on Custodians and Maintenance Association Contract July 1, 2023 to June 20, 2026
  - Discussion and Possible Action on Healthy Food Certification
  - Action on Minutes of May 16, 2023
  - Action on Minutes of May 23, 2023
- Item 9 \*\*PUBLIC PARTICIPATION  
Item 10 EXECUTIVE SESSION
- Discussion and Possible Action on Appointment of Newtown High School Assistant Principal
  - Discussion and Possible Action on Non-union Salary Increases
  - Discussion and Possible Action on Personnel Request
- Item 11 PUBLIC SESSION FOR POSSIBLE VOTE ON EXECUTIVE SESSION ITEMS  
Item 12 ADJOURNMENT

*\*\*During the first Public Participation, the Board welcomes commentary regarding items on the agenda. After being recognized, please state your name and address for the record. We request that speakers be respectful and limit comments to not more than three minutes. The Board of Education does not discuss personnel items or student matters in public. During the second Public Participation, commentary may address the agenda or may introduce issues for the Board to consider in the future. The Board does not engage in dialogue during either public comment period. If you desire more information or answers to specific questions, please email the BOE: [NewtownBOE@newtown.k12.ct.us](mailto:NewtownBOE@newtown.k12.ct.us)*



# Kitchen Science Gr. 7

2 Curriculum Developers | Last Updated: Tuesday, May 2, 2023 by Iacofano, Elizabeth

## Unit Calendar by Year

Unit	Au	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Ju																											
Food Chemistry and Food Safety	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Lessons	0																																					

1 Unit found

Previous Year



# Unit Planner: Food Chemistry and Food Safety Kitchen Science Gr. 7

Monday, May 1, 2023 11:26AM

Newtown Middle School / 2022-2023 / Grade 7 / Science / Kitchen Science Last Updated: Tuesday, May 2, 2023 by Elizabeth Iacofano

## Food Chemistry and Food Safety

Bradley, Nancy; Iacofano, Elizabeth

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

[Unit Web Template \(Optional\)](#)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Lens: Change

Concepts: Structure, Process, Motion, Energy, Transformation, Growth, Function, Health

G

#### Generalizations / Enduring Understandings

1. Adding energy to a system creates a change in motion which when sufficient leads to a change in the state of matter or chemical transformation.

2. A change in molecular structure affects function.

3. Following specific processes for storing and cooking food reduces the likelihood of bacterial growth thereby affecting health.

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

1a. What are the three states of matter? (F)

1b. What is an atom? (F)

1c. What is a molecule? (F)

1d. What is a solution? (F)

1e. What is a mixture? (F)

1f. What is the difference between a physical change and a chemical change? (F)

1g. What happens to molecules when they are heated up and cooled down? (F)

1h. What is bench tolerance and how do the three leavening gases in baked goods affect bench tolerance? (F)

1i. Why do oil and water separate when in a mixture? (C)

1j. Why does dissolved sugar come out of solution when cooled? (C)

- 1k. Why does a cut up apple turn brown? (C)
- 1l. How does adding heat enhance the leavening process? (C)
- 1m. Which is more useful, baking soda or baking powder and why? (P)
- 2a. What is sugar and what are examples of different types of sugar? (F)
- 2b. What is a protein? (F)
- 2c. What are the different structures of proteins? (F)
- 2d. What are the three components in a wheat kernel? (F)
- 2e. What is gluten and how is it formed? (F)
- 2f. How does the hygroscopic nature of sugar contribute to its function? (C)
- 2g. How does protein structure affect its function? (C)
- 2h. How can protein denaturation occur when preparing food? (C)
- 2i. How do eggs provide structure in cake? (C)
- 2j. How does the Maillard reaction occur when food is cooked? (C)
- 2k. How does flour provide structure? (C)
- 2l. Which has more gluten: wheat or white flour and why? (C)
- 2m. Is high fructose corn syrup safe to consume? (P)
- 2n. What are the pros and cons to alternatives to sugar? (P)
- 2o. Which is healthier: wheat or white flour and why? (P)
- 3a. What is a foodborne illness (F)
- 3b. What happens to food when heated and how does this relate to prevention of illness from a microorganism? (C)
- 3c. What needs to be considered to safely purchase and

transport food?(C)

3d.What are the best ways to safely store food? (C)

3e. How can foodborne illnesses be avoided? (C)

3f.Is bacteria good or bad? Why? (P)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**NGSS: Science Performance Expectations (2017)**

**NGSS: MS Physical Science**

**MS.Structure and Properties of Matter**

**Performance Expectations**

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

**MS.Chemical Reactions**

**Performance Expectations**

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

**NGSS: MS Life Science**

**MS.Matter and Energy in Organisms and Ecosystems**

**Performance Expectations**

MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

**MS.Growth, Development, and Reproduction of Organisms**

**Performance Expectations**

MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

**NGSS: Disciplinary Core Ideas**

**NGSS: 6-8**

**PS1: Matter and Its Interactions**

### **PS1.A: Structure and Properties of Matter**

Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-2), (MS-PS1-3)

Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (MS-PS1-4)

In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (MS-PS1-4)

The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-4)

### **PS1.B: Chemical Reactions**

Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-2),(MS-PS1-3),(MS-PS1-5)

### **PS3: Energy**

#### **PS3.A: Definitions of Energy**

The term "heat" as used in everyday language refers both to thermal motion (the motion of atoms or molecules within a substance) and radiation (particularly infrared and light). In science, heat is used only for this second meaning; it refers to energy transferred when two objects or systems are at different temperatures. (secondary to MS-PS1-4)

Temperature is not a measure of energy; the relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. (secondary to MS-PS1-4)

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Access the interactive version of the NGSS [here](#)

### **Critical Content & Skills**

*What students must **KNOW and be able to DO***

#### Generalization 1

Students will know that:

- the four states of matter are liquid, solid, gas, and plasma
- an atom is the smallest unit of matter that makes up an element
- a molecule is a group of atoms bonded together
- a mixture is made up of two or more different substances that are not chemically combined
- a solution is a mixture in which two or more substances are well mixed (homogeneous). Best known when a solute is dissolved in a solvent
- a physical change occurs when a substance changes its appearance/state of matter where a chemical change results in the formation of a new substance
- when molecules are heated up, they start vibrating/moving faster causing them to bang into each other and, in turn, causing them to spread out which leads to a decrease in density as the volume increases. When molecules cool down, they slow down allowing the attraction between molecules to bring them closer leading to a decrease in volume and increase in density.
- oil and water don't naturally mix. This is because water molecules prefer to stick with other water molecules and they move as far from the oil molecules as possible. The same is true for the oil molecules, which are hydrophobic. As a result, oil and water molecules are happiest furthest from each other so they separate into layers when mixed together. The drops of oil separate from the water droplets and touch one another then merge to form a single drop of oil. This happens until the two liquids completely separate into two layers. The more dense water is at the bottom and oil is on the top. These fluids are called immiscible because they don't dissolve in one another. When making a vinaigrette of oil and vinegar(vinegar is mostly water), adding another ingredient, such as mustard, will help bind the oil and vinegar together by forming a buffer between the oil and water. The molecules that make up the mustard are amphiphilic: one half of each molecule is hydrophilic and likes to be in water and the other half is hydrophobic and likes to be in oil. We've formed an emulsion and the ingredients appear to be mixed but aren't at the molecular level. The oil is still separated from the water but the mustard binds it all together.

- when you supersaturate a solution with sugar, it is unstable as there is more solute than can stay in liquid form. When the solution cools, sugar molecules combine with each other and form crystals. As the solution continues to cool, more and more molecules combine making hard candy.
- bench tolerance is the measure of how well batters and doughs tolerate being held before baking without risking a large loss in leavening gases. It is affected by the thickness of the batter/dough and the leavening agent used.
- the three main leavening gases in baked goods are air, steam, and carbon dioxide.
- leavening agents cause baked goods to rise providing lightness and volume. Heat causes the gases to expand making them larger. This causes the cell walls to stretch increasing the volume. This, in turn, creates a strong structure preventing baked goods from collapsing.
- baking soda and baking powder are both leaveners but they are chemically different. Baking soda is sodium bicarbonate, which is a base, and needs an acid to produce gas. Baking powder is baking soda plus a dry acid. As a result, it doesn't need an acid to perform its leavening function. So baking powder is used when there is not an acid present in the ingredients and baking soda is used when an acid is part of the ingredients.
- a cut up apple turns brown due to a process called enzymatic browning. When the cut apple is exposed to oxygen, an enzyme, polyphenol oxidase (PPO), is triggered to oxidize micronutrients called polyphenols. This results in a new chemical to be produced that reacts with amino acids to produce brown-colored melanins. Different types of apples contain different amounts of PPO and polyphenols so they brown at different rates.

Students will be able to:

- create a heterogeneous and homogenous mixture and a solution.
- separate a solution into individual parts.
- explain the difference between baking soda and baking powder based on an activity investigating both.
- explain what happens to molecules when heated and cooled.
- explain the purpose of adding salt to winter roads.
- explain the function of yeast and how to activate it.
- explain why apples get brown when exposed to air.

## Generalization 2

Students will know that:

- sugars are simple carbohydrates: molecules that consist of carbon, hydrogen, and oxygen atoms arranged in a specific way. They are further classified as monosaccharides (one sugar unit) also known as simple sugars, disaccharides (two sugar units bonded together), oligosaccharides (usually 3-10 sugar units bonded to a chain), and polysaccharides (often thousands of sugar units). Common simple sugars are glucose and fructose. These are naturally present in many ripened fruit and are important in the makeup of many syrups. Maltose (malt sugar) is an example of a disaccharide that is commonly found in glucose corn syrup and malt syrup while lactose is a disaccharide found in dairy products and sucrose (table sugar) is the most common sugar in the bakeshop as it is glucose bonded to fructose. Oligosaccharides are often called dextrans and are present in many syrups used in the bakeshop. Lastly, starch is an example of a polysaccharide.
- some of the functions of sweeteners are related to their hygroscopic properties, or their ability to attract and hold water. Sugars are important in tenderizing because once dissolved, they interfere with gluten formation, protein coagulation, and starch gelatinization. This is because gluten, eggs, and starch structure all depend on water so sugars strong ability to attract water keeps it away from them thereby not allowing them to build structure and increasing the tenderness of the product. The more sugar added, the more the delay to structure formation and the more tender the baked good. If too much sugar is added, too little structure forms and the product will never rise or if it does rise, it will collapse when it cools. In the end, the hygroscopic nature of sugar increases the softness and moistness in freshly baked goods and extends their shelf life by keeping them from drying and staling. Fructose is the most hygroscopic of the sugars so syrups that contain a significant amount of fructose such as honey, high fructose corn syrup, and agave syrup, provide more moistness than other syrups or granulated sugar.
- there are healthy and unhealthy substitutes for sugar.
- the Maillard reaction produces browning on cooked food. This occurs when the amino acids in the food binds

with sugar in the presence of heat. The molecule that results breaks down, binds to new molecules, and breaks down further. This process forms hundreds of new flavor molecules and causes browning to occur on the outside of the food.

- proteins are very large molecules made up of many amino acids linked together into long chains. There are 20 amino acids living organisms use to make proteins - 9 are essential which means they cannot be made so we must eat them in food.
- there are four levels of structure for proteins: primary, secondary, tertiary, and quaternary. There are two major classes of proteins based on shape: fibrous proteins (linear shape) such as glutenin which forms the backbone of gluten (important in baked goods), ovomucin in egg whites, elastin in tendons, collagen in connective tissue, and keratin in hair and nails, and globular proteins (spherical shape) such as ovalbumin in egg whites and hemoglobin.
- egg whites, or egg albumen consists of more than 6 different types of proteins. This mix is responsible for most of the function of egg whites such as structure building and aeration. The egg yolk also provides structure in baked goods because it contains lipoproteins (proteins bound to fats and emulsifiers such as lecithin). These lipoproteins bond to both water and oil thereby binding complex mixtures of ingredients such as cake batter.
- when heat is added to protein, the protein wiggles breaking the bonds that hold the three-dimensional structure together and the protein unfolds or denatures. This causes the protein to not function properly.
- when you add a higher amount of heat to protein, it unfolds even further and causes the proteins to coagulate or stick together changing the liquid to a solid. Example: an egg cooking. The albumin goes from a clear liquid to a white solid as the protein denatures. Each of the proteins in eggs denature at a slightly different temperature so the egg appears different as it cooks.
- flour provides structure: Wheat is the most popular cereal grain for use in baked goods due mostly to the gluten that forms when flour is mixed with water. Without gluten, raised bread would not occur. Wheat kernels or wheat grains are the seeds of the wheat plant and they are the part milled into flour. There are three parts: the endosperm, the germ, and the bran. Whole wheat flour contains all three parts so it is considered whole grain while white flour is milled from the endosperm, which makes up 80% of the wheat kernel and is made up of mostly starch. Two proteins in the endosperm are glutenin and gliadin. When flour is mixed with water, glutenin and gliadin form a network of gluten, which is important in the structure of baked goods. The germ is the embryo of the wheat plant and contains many vitamins and minerals and is high in protein. The bran is the protective covering of the wheat kernel and is high in dietary fiber, protein, fat, B vitamins, and minerals. Bran and germ proteins are not gluten forming and actually interfere with gluten formation.

Students will be able to:

- determine the difference between molecular structures based on smell.
- investigate the amount of water sugar absorbs
- explore the function of thickeners in cooking
- observe the Maillard reaction when cooking.
- observe crystal formation of sugar and also how to avoid crystal formation when not desired.
- observe protein denaturation in eggs.
- investigate how proteins in eggs whites are stabilized by sugar in order to make a desired type of cookie.
- identify which flour creates the most gluten.
- observe the function of leavening agents in baking.
- research sugar substitutes and the GMO sugar beet controversy

### Generalization 3

Students will know that:

- before food is cooked, it is filled with microorganisms (bacteria and fungi) that can be harmful if ingested. Small amounts of heat can cause the proteins within the microorganisms to malfunction and the organism dies. Most live and multiply in a temperature range of a few degrees above freezing to 122 degrees F. At cooler temperatures, it is too cold for microbes to survive and grow. This is why freezing and refrigeration are



effective ways to preserve food.

- in order to safely purchase food: check the expiration (sell by or best by) dates and checked canned goods for damage (swollen, bulging, leaking, dents)
- when purchasing eggs, choose only refrigerated eggs and make sure they are clean and are not cracked as bacteria from cracked eggs can be transferred to the surface of, and then inside of, a neighboring uncracked egg.
- when purchasing produce, fruits and vegetables have a short shelf-life so they should not be bought in bulk unless they will be cooked/eaten in short order. Don't purchase produce that is bruised, shriveled, moldy, slimy, or have soft spots.
- when purchasing meat, fish, poultry, dairy: check expiration/sell by date. Place raw seafood, meat, and poultry in plastic bags to prevent cross contamination to other foods in the shopping cart. Choose only pasteurized dairy products as this process ensures no harmful bacteria will be present.
- it's important to shop for refrigerated foods, frozen foods, and hot deli items last to ensure they are not in the danger zone (40-140 degrees F) for more than 2 hours.
- it's important to bag and transporting food, bag meat, seafood, poultry in a bag separate from all other food; bag cold/frozen items together; separate non-food items such as cleaning supplies. Place cold foods in the coldest part of the car: backseat with the A/C on in the summer and in the trunk in the winter.
- storage of perishable foods involves the following: Meat, poultry, and seafood should be stored in the lowest part of the refrigerator as this where the coldest air circulates and it prevents cross-contamination by containing dripping juices so they don't come in contact with ready-to-eat foods. Dairy and egg products should be stored on the refrigerator shelves and never in the door. The door is the warmest area in the refrigerator so it should be for storing condiments, nondairy drinks, jarred foods, etc. Keep fruits and veggies in the crisper.
- storage of nonperishable foods involves the following: nonperishable foods such as canned goods, pasta, flour, cereal, peanut butter, and rice should be stored in a dark, dry, cool space kept at room temperature. These foods do best in a cupboard or pantry away from the range, over, dishwasher, or refrigerator exhaust
- it is important to discard cans that are leaking, bulging, dented, or rusty. Low-acid canned foods such as stews, soups, vegetables, pasta maintain their quality for 2-5 years, high-acid canned foods such as tomato products, fruits, sauerkraut, and salad dressings maintain their quality for 12-18 months, and canned fruit juices maintain their quality for approximately 9 months.
- researchers have identified more than 250 foodborne diseases most of them caused by bacteria, viruses, and parasites. However, harmful toxins and chemicals can also contaminate food causing illness. It can be avoided by following 4 steps: clean, separate, cook, and chill. Clean your hands, work surface, and tools with hot soapy water and rinse fruits and vegetables under running water. Keep raw meat, seafood, poultry, and eggs separate from all other foods, cook food to the correct temperature using a food thermometer where appropriate, and chill/refrigerate promptly (keep your refrigerator at 40 degrees F or below, refrigerate perishables within 2 hours, and thaw frozen food in the refrigerator, in cold water, or in the microwave; not on the counter).

Students will be able to:

- store food safely.

## Core Learning Activities

Generalization 1:

1. Mixture/Solution/Solubility activities- investigate the difference between a mixture and a solution

2. emulsions and adding heat to marshmallows - observe molecules that are hydrophobic, hydrophilic, and

amphiphilic and observe what happens when molecules are heated

3. Leavening agents activity - investigate the difference between different leavening agents.
4. Chemical Change Activities - creating bubbles and heat through chemistry to leaven dough; blowing up a balloon when yeast, water, and sugar are added; observing the Maillard reaction.
5. Making ice cream activity - salt lowers freezing point of water making it colder

Generalization 2:

1. Investigating the hygroscopic nature of sugar - using sugar cubes and colored water to see sugar's absorption power
2. investigating pectin by making strawberry jam - pectin is a natural thickening agent that is activated when sugar is added to the acid in strawberries
3. Making Hard Candy - investigate crystal formation of sugar
4. Investigating Protein Denaturation - investigate protein denaturation through heating egg whites and beating them.
5. Making Toll House Cookies - applying knowledge of sugar, flour, protein, and yeast.
6. Measuring the amount of sugar in beverages - use a hygrometer to determine the sugar level in beverages
7. Making Homemade Soft Pretzels - investigate gluten and the function of yeast using white flour.
8. Sugar Substitutes Assignment - web-based research assignment investigating common sugar substitutes.

Generalization 3:

1. Food Safety Assignment - read an article and watch videos while answering questions

## Assessments



### Assessments



7 Food safety assignment S2

## Resources

### *Professional & Student*

#### Books:

1. The Food Safety Book by Joe Kivett and Dr. Mark Tamplin with Dr. Gerald J. Kivett Copywrite 2016
2. Awesome Kitchen Science Experiments for Kids by Dr. Megan Olivia Hall, Copywrite 2020
3. How Baking Works, 3rd edition by Paula Figoni, Copywrite 2011
4. Culinary Reactions: The Everyday Chemistry of Cooking by Simon Quellen Field, Copywrite 2012
5. The Science of Cooking by Dr. Stuart Farrimond, Copywrite 2017
6. Science and Cooking by Michael Brenner, Pia Sorensen, and David Weitz, Copywrite 2020

#### Websites:

[Leavening agents information](#)

[Exploratorium - The Accidental Scientist: The Science of Cooking](#)

[Sciencebob.com](#)

[100 amazing food experiments for kids](#)  
[Simple experiments and activities for youth](#)

[Science Buddies](#)

[Food Science Experiments - Steve Spangler](#)

[sugar crystal ornaments](#)

[Food science activities for middle school](#)

**Student Learning Expectation & 21st Century Skills**

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

**Interdisciplinary Connections**

This unit connects to math when measuring, to health when discussing nutrition and food preservation, and to literacy when students analyze data and explain the science behind what they observe.



Newtown Public Schools



# Kitchen Science Gr. 8 (Pilot)

2 Curriculum Developers | Last Updated: Tuesday, May 2, 2023 by Iacofano, Elizabeth

## Unit Calendar by Year

Unit	Au	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Ju																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
<b>Lessons</b>	0																																							
<small>Draft</small> Waves, Molecular Motion, an...	0																																							
<small>Draft</small> Food Chemistry	0																																							
<small>Draft</small> Food Preservation	0																																							

3 Units found

Previous Year



# Unit Planner: Waves, Molecular Motion, and Senses

## Kitchen Science Gr. 8

Newtown Middle School / 2022-2023 / Grade 8 / Science / Kitchen Science  
Gr. 8 (Pilot) / Week 1 - Week 3

Last Updated: Tuesday, May 2, 2023 by  
Elizabeth Iacofano

### Waves, Molecular Motion, and Senses

Bradley, Nancy; Iacofano, Elizabeth

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Lens: Change

Concepts: Structure, Process, Motion, Energy (heat and electromagnetic), Transformation, Function, Health

G

#### Generalizations / Enduring Understandings

1. Food cooks when heat and electromagnetic energy transfer from one source to another.
2. Cooking food causes a change in structure and function.
3. Specialized cells located in our sense organs collect sensory information that is then brought to our brain for interpretation resulting in our ability to taste and smell food.

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

- 1a. What is electromagnetic radiation? (F)
- 1b. What is a wave? (F)
- 1c. What are the parts of a wave? (F)
- 1d. What is the difference between a light and a sound wave? (F)
- 1e. How are microwaves different from the other types of waves in the electromagnetic spectrum? (C)
- 1f. What is the difference between a microwave oven, conventional oven, and a convection oven when cooking food? (C)
- 1g. Is radiation harmful to humans? (P)
- 1h. What are the pros and cons of the three types of ovens? (P)
- 2a. What is the difference between a physical change and a chemical change? (F)
- 2b. What happens to molecules when they are heated

	<p>up and cooled down? (F)</p> <p>2c. How does a microwave lead to cooked food? (C)</p> <p>2d. How do the different types of heat transfer apply to cooking? (C)</p> <p>3a. What is the difference between a stimulus and a receptor? (F)</p> <p>3b. What is a neuron? (F)</p> <p>3c. How do specialized cells contribute to the ability to taste and smell? (C)</p> <p>3d. Why do different foods smell and taste different? (P)</p> <p>3e. How are taste and smell connected? (C)</p>
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**Standard(s)**

*Connecticut Core Standards / Content Standards*

**NGSS: Science Performance Expectations (2017)**

**NGSS: MS Physical Science**

**MS.Waves and Electromagnetic Radiation**

**Performance Expectations**

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

**NGSS: MS Life Science**

**MS.Structure, Function, and Information Processing**

**Performance Expectations**

MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

**MS.Matter and Energy in Organisms and Ecosystems**

**Performance Expectations**

MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

## MS.Growth, Development, and Reproduction of Organisms

### Performance Expectations

MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

## NGSS: Disciplinary Core Ideas

### NGSS: 6-8

#### LS1: From Molecules to Organisms: Structures and Processes

##### LS1.D: Information Processing

Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1-8)

#### PS4: Waves and Their Applications in Technologies for Information Transfer

##### PS4.A: Wave Properties

A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1)

##### PS4.B: Electromagnetic Radiation

The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. (MS-PS4-2)

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Access the interactive version of the NGSS [here](#)

## Critical Content & Skills

### What students must **KNOW and be able to DO**

#### Generalization 1

Students will know that:

- electromagnetic radiation is one way energy travels through space. The heat from a burning fire, the light from the sun, the X-rays used by your doctor, as well as the energy used to cook food in a microwave are all forms of electromagnetic radiation. All these forms of energy exhibit wavelike properties.
- a wave is a disturbance in a medium or field that results in vibration or oscillation.
- a wave has a *trough* (lowest point) and a *crest* (highest point). The vertical distance between the tip of a crest and the wave's central axis is known as its *amplitude*. This is the property associated with the brightness, or intensity, of the wave. The horizontal distance between two consecutive troughs or crests is known as the *wavelength* of the wave.
- the quantity known as the wave's *frequency* refers to the number of full wavelengths that pass by a given point in space every second; the SI unit for frequency is Hertz, which is equivalent to "per seconds"
- wavelength and frequency are inversely proportional: that is, the shorter the wavelength, the higher the frequency, and vice versa.
- a wave's period is the length of time it takes for one wavelength to pass by a given point in space.
- electromagnetic waves can be classified and arranged according to their various wavelengths/frequencies; this classification is known as the electromagnetic spectrum.
- the visible spectrum—that is, light that we can see with our eyes—makes up only a small fraction of the different types of radiation that exist. To the right of the visible spectrum are the types of energy that are lower in frequency (and thus longer in wavelength) than visible light. These types of energy include infrared (IR) rays (heat waves given off by thermal bodies), microwaves, and radio waves. These types of radiation surround us constantly, and are not harmful, because their frequencies are so low. Lower frequency waves are lower in energy so are not dangerous to our health.
- to the left of the visible spectrum are ultraviolet (UV) rays, X-rays, and gamma rays. These types of radiation



are harmful to living organisms, due to their extremely high frequencies (and thus, high energies). It is for this reason that we wear suntan lotion at the beach (to block the UV rays from the sun) and why an X-ray technician will place a lead shield over us, in order to prevent the X-rays from penetrating anything other than the area of our body being imaged. Gamma rays, being the highest in frequency and energy, are the most damaging. Luckily though, our atmosphere absorbs gamma rays from outer space protecting us from harm.

- at the beginning of the twentieth century, the discovery that energy is quantized led to the revelation that light is not only a wave, but can also be described as a collection of particles known as photons. Photons carry discrete amounts of energy called quanta. This energy can be transferred to atoms and molecules when photons are absorbed. Atoms and molecules can also lose energy by emitting photons
- light waves are electromagnetic waves while sound waves are mechanical waves. Light waves are transverse (move up and down) while sound waves are longitudinal (move left and right). Light waves can travel in vacuum. Sound waves require a material medium to travel, and hence, cannot travel in vacuum.
- microwave ovens use electromagnetic radiation produced by microwaves to heat food. Microwaves are produced inside the oven by a component called a magnetron. These microwaves are reflected within the interior of the oven where they are absorbed by the food.
- microwaves cause water molecules to vibrate producing heat that cooks food. The interior of the oven is not heated; only the food.
- a conventional oven uses metal, wood, or an electric current to heat food. The interior of the conventional oven is heated up using a temperature gauge which then heats the food. Some spots of the oven may be hotter than others so food may not cook evenly. As a result, it must be turned half way through cooking.
- sometimes the oven contains a fan which distributes the heat evenly around the interior of the oven so food cooks evenly. This type of oven is a convection oven.

Students will be able to:

- explain what a wave is and what the parts of a wave are.
- explain what electromagnetic radiation is.
- explain the areas of the electromagnetic spectrum.
- explain the difference between a microwave oven and a conventional oven.
- explain how a microwave oven works.
- explain how conventional and convection ovens work.

Generalization 2

Students will know that:

- a physical change occurs when a substance changes its appearance/state of matter where a chemical change results in the formation of a new substance
- when molecules are heated up, they start vibrating/moving faster causing them to bang into each other and, in turn, causing them to spread out which leads to a decrease in density as the volume increases. When molecules cool down, they slow down allowing the attraction between molecules to bring them closer leading to a decrease in volume and increase in density.
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- heat transfer is the movement of energy from one place to the next. Conduction is the transfer of energy between adjacent molecules, convection involves the movement of heated fluid, and radiation refers to the transmission of energy in the form of electromagnetic radiation from one surface to another surface.
- transfer of heat in a pot of boiling water involves all three types of heat transfer: the hot burner transfers heat to the pot via radiation, the molecules start moving quickly when heated up bumping into each other transferring energy via conduction, and a convection current is created since the molecules are moving quickly and spread out as a result of bumping into other water molecules. This causes a decrease in density and the molecules move upward. When the molecules are further from the heat source, they cool down causing them to slow down and move closer together decreasing the volume and increasing the density.

This causes them to sink. This pattern repeats causing what's called a convection current.

Students will be able to:

- explain the difference between a physical and chemical change
- explain what happens when molecules become heated
- explain how a microwave oven cooks food
- explain how heat is transferred when cooking

### Generalization 3

Students will know that:

- a stimulus is what causes the nervous system to respond. It can be an internal or external stimulus. In the case of smell, it's an external stimulus. With taste, it's an internal stimulus.
- a receptor is what receives the stimulus. In the case of smell and taste, it's a sense organ (nose and mouth).
- a neuron is a nerve cell. It carries messages throughout the body.
- a sensory neuron is what takes the impulse created from the stimulus to the brain.
- the process of smelling is as follows: When humans sniff, odor molecules (stimuli) in the air are dissolved in the olfactory mucus in the nasal cavity. Olfactory receptor cells in olfactory epithelium detect these odors and send the electrical signals on to the olfactory bulbs. These signals are then sent along olfactory tracts to the olfactory cortex of the brain where the impulse is interpreted as a smell.
- humans can detect millions of different smells. Approximately 10 million olfactory receptor cells are in the olfactory mucosa.
- anosmia is the inability to detect smell. It can be temporary or permanent.
- taste receptor cells (taste buds) on the tongue and roof of the mouth are responsible for the ability to taste.
- taste buds send information to the brain via three cranial nerves.
- smell and taste are connected since the food molecules go from the mouth to the nasal cavity. If that cavity is inflamed, the molecules won't get to the olfactory nerves and then to the olfactory bulb. In turn, the impulse won't be created and sent to the brain.

Students will be able to:

- explain the process of how humans are able to smell
- explain what a neuron is and its importance in smelling and tasting
- explain how the sense of taste is related to the sense of smell

## Core Learning Activities

### Generalization 1

Wave speed activity

## Generalization 2

Molecular Motion Activity: making popcorn

### Assessments

### Resources

*Professional & Student*

[Introduction to Electromagnetic Waves - Khan Academy](#)

[Differences between conventional oven and microwave oven](#)

[The Physics Classroom - describing waves](#)

[nasal cavity diagram](#)

[The Science Behind Taste and Smell](#)

[The science behind the taste and smell of food video](#)

### Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

### Interdisciplinary Connections

This unit connects to 7th grade science in the discussion of what a wave is, the parts of a wave, and how it applies to both cooking and earthquakes and to literacy when students analyze data and explain the science behind what they observe.



# Unit Planner: Food Chemistry Kitchen Science Gr. 8

Thursday, May 4, 2023, 11:38AM

Newtown Middle School / 2022-2023 / Grade 8 / Science / Kitchen Science  
Gr. 8 (Pilot) / Week 4 - Week 20

Last Updated: Tuesday, May 2, 2023 by  
Elizabeth Iacofano

## Food Chemistry

Bradley, Nancy; Iacofano, Elizabeth

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

Please attach your completed Unit Web Template here

Lens: Change

Concepts: Structure, Process, Motion, Energy, Transformation, Growth, Function

G

#### Generalizations / Enduring Understandings

1. Adding energy to a system brings about a change in motion. Adding a sufficient amount of energy to a system leads to a change in the state of matter or a chemical transformation.

#### Guiding Questions

**Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]**

- 1a. What are the three states of matter? (F)
- 1b. What is an atom? (F)
- 1c. What is a molecule? (F)
- 1d. What is a solution? (F)
- 1e. What is a mixture? (F)
- 1f. What are the three main leavening gases in baked goods? (F)
- 1g. What is an emulsion? (F)
- 1h. What does it mean to sauté? (F)
- 1i. What is a roux? (F)
- 1j. What is a fat? (F)
- 1k. What are the different types of butter? (F)
- 1l. Why does dissolved sugar come out of solution when cooled? (C)
- 1m. Why do oil and water separate when in a mixture? (C)

1n. How does adding heat enhance the leavening process?(C)

1o. What is the difference between a saturated, unsaturated, polyunsaturated, and trans fatty acids? (C)

1p. How is butter made? (C)

1q. What is the difference between moisture and moistness? (C)

1r. Do different types of butter have an impact on cooking? (C)

1s. What is the function of butter in cooking? (C)

1t. How does the temperature of the butter affect its use in baking? (C)

1u. What is the difference between sauté and stir-fry? (C)

1v. Why is a roux used when cooking? (C)

1w. What is spherification and how is it used with food? (C)

1x. Does the use of nitrogen fixation in plants affect humans? (P)

1y. Are there benefits to sautéing? (P)

## Standard(s)

*Connecticut Core Standards / Content Standards*

**NGSS: Science Performance Expectations (2017)**

**NGSS: MS Physical Science**

**MS.Structure and Properties of Matter**

**Performance Expectations**

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

**MS.Chemical Reactions**

**Performance Expectations**

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to

determine if a chemical reaction has occurred.

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Access the interactive version of the NGSS [here](#)

## Critical Content & Skills

*What students must **KNOW** and be able to **DO***

### Generalization 1

Students will know that:

- the four states of matter are liquid, solid, gas, and plasma
- an atom is the smallest unit of matter that makes up an element
- a molecule is a group of atoms bonded together
- a mixture is made up of two or more different substances that are not chemically combined
- a solution is a mixture in which two or more substances are well mixed (homogeneous). Best known when a solute is dissolved in a solvent
- oil and water don't naturally mix. This is because water molecules prefer to stick with other water molecules and they move as far from the oil molecules as possible. The same is true for the oil molecules, which are hydrophobic. As a result, oil and water molecules are happiest when furthest from each other so they separate into layers when mixed together. The drops of oil separate from the water droplets and touch one another then merge to form a single drop of oil. This happens until the two liquids completely separate into two layers. The more dense water is at the bottom and oil is on the top. These fluids are called immiscible because they don't dissolve in one another.
- an emulsion is made when making a vinaigrette of oil and vinegar (vinegar is mostly water). Adding another ingredient, such as mustard, will help bind the oil and vinegar together by forming a buffer between the oil and water. The molecules that make up the mustard are amphiphilic: one half of each molecule is hydrophilic and likes to be in water and the other half is hydrophobic and likes to be in oil. We've formed an emulsion and the ingredients appear to be mixed but aren't at the molecular level. The oil is still separated from the water but the mustard binds it all together.
- cream is an emulsion in that fat molecules are dispersed in the main component, water. Whipping up cream, however, shakes the system enough to invert the emulsion. Fat molecules become the continuous phase with particles of water dispersed within, creating butter!
- a supersaturated solution of sugar is unstable as there is more solute than can stay in liquid form. When the solution cools, sugar molecules combine with each other and form crystals. As the solution continues to cool, more and more molecules combine making hard candy.
- the three main leavening gases in baked goods are air, steam, and carbon dioxide.
- leavening agents cause baked goods to rise providing lightness and volume. Heat causes the gases to expand making them larger. This causes the cell walls to stretch increasing the volume. This, in turn, creates a strong structure preventing baked goods from collapsing.
- a fat molecule consists of two main components: glycerol and fatty acids. Since fats consist of three fatty acids and a glycerol, they are also called triacylglycerols or triglycerides. Fats can be unsaturated or saturated.
- in a fatty acid chain, if there are only single bonds between neighboring carbons in the hydrocarbon chain, the fatty acid is said to be saturated. Saturated fatty acids are saturated with hydrogen since single bonds increase the number of hydrogens on each carbon. Stearic acid and palmitic acid, which are commonly found in meat, are examples of saturated fats.
- when the hydrocarbon chain contains a double bond, the fatty acid is said to be unsaturated. If there is only one double bond in the molecule, then it is known as a monounsaturated fat; e.g. olive oil. If there is more than one double bond, then it is known as a polyunsaturated fat; e.g. canola oil.
- unsaturated fatty acids have one or more double bonds. Each double bond may be in a cis or trans configuration.  
In the cis configuration, both hydrogens are on the same side of the hydrocarbon chain. In the trans configuration, the hydrogens are on opposite sides. A cis double bond causes a kink in the chain.
- most unsaturated fats are liquid at room temperature and are called oils. Unsaturated fats help to lower blood

cholesterol levels whereas saturated fats contribute to plaque formation in the arteries. Unsaturated fats or oils are usually of plant origin.

- in the food industry, oils are artificially hydrogenated to make them semi-solid and of a consistency desirable for many processed food products. During this hydrogenation process, gas is bubbled through oils to solidify them, and the double bonds of the cis-conformation in the hydrocarbon chain may be converted to double bonds in the trans-conformation.
- essential fatty acids are fatty acids required for biological processes, but not synthesized by the human body so they must be ingested.  
Omega-3 fatty acid, or alpha-linoleic acid (ALA), falls into this category and is one of only two fatty acids known to be essential for humans (the other being omega-6 fatty acid, or linoleic acid).
- salmon, trout, and tuna are good sources of omega-3 fatty acids.
- butter is a concentrated fat produced from churning cow's milk or cream. When milk is churned, meaning stirred or beat in high intensity, the solid and liquid components within it split. The solid part that you get as a result of this process, is butter, and the liquid that is left is called buttermilk. So butter is made by churning cream until it separates into liquids (buttermilk) and solids (butterfat).
- butter isn't completely fat. Commercial butter that is commonly used in baking generally has over 80% fat with the rest being water that's emulsified into the fat.
- contrary to the name, sweet cream butter has not been sweetened. In general, sweet cream butter is better for spreading on toast, while unsalted butter is better for baking. This is so the exact amount of salt added to recipes is controlled.
- Using unsalted butter allows the baker to control the overall salt content of a recipe.
- it's best to use unsalted butter in things like buttercream frosting as the salt in salted butter can end up making delicate, sweet pastries taste overly salty.
- in North America, commercially sold butter must contain at least 80 percent butterfat, while European butters typically contain at least 82 percent and up to about 85 percent. The remaining contents of the butter's makeup includes water and milk solids. The lower the butterfat content, the more liquid (and less fat) is being added to the recipe; the higher the butterfat content, the more fat (and less liquid).
- moisture refers to the liquid content while moistness refers to the fat. Nearly all recipes call for both, but for different reasons. In general, fat (including that in butter) tenderizes baked goods. Liquids (again, including that in butter) help hydrate proteins (found in flours and starches), bind ingredients together, and also aid in moistening.
- butter in baking adds flavor, adds softness, adds moisture, aids in leavening, lengthens shelf-life.
- butter itself has many chemical and physical properties that play roles in the baking process. Starch and protein in flour will toughen dough, while sugar tenderizes it. Butter is mostly fat, so it tenderizes dough, however it still possesses 16 percent water, which will act to strengthen dough. This principle is used to make puff pastry, where the layers of dough folded on top of each other use the steam that evaporates from butter chunks in the dough to become airy and flaky in the oven.
- moisture and flavor might be the most obvious reasons to use butter in baked goods, but there are several other roles butter is playing as well. In things like cakes, cookies, and muffins, butter coats the proteins and starches during the mixing step and results in a more delicate crumb.
- in many of these types of pastries, the butter is creamed with the sugar before being mixed with other ingredients. Through this process, the sugar granules actually cut into the softened butter and air is forced into the mixture, which ultimately helps to leaven the pastry.
- even in recipes that do not call for the creaming method, butter assists in leavening by creating steam when placed in a hot oven. The liquid portion of butter adds moisture (as opposed to the *moistness* added from the fat), and in baked goods like puff pastry and croissants, the liquid in the butter begins to evaporate and create steam, which lifts the pastry as it bakes.
- temperature is a key factor in how butter behaves within a recipe and how it mixes with other ingredients in a batter or dough. Rarely does a recipe list butter without noting if it should be cold from the fridge, softened to room temperature, or even melted.
- with softened butter, the fat can be easily creamed together with sugar, or used to coat flour particles. This creates a more even distribution of fat throughout the dough or batter, yielding a tender final product. Like using room-temperature eggs, room-temperature butter creates a more homogenous batter and prevents buttercream from "breaking."
- softened butter should still be cool, but malleable. It should be able to hold its shape and still firm enough that if you press your finger into it, the impression is clean. It should not be squishy, oily, or appear melted. Too-warm or melted butter loses its ability to cream and hold air when beaten. This is best for making cakes. Butter that is at this state emulsifies with sugar easily and allows air to be incorporated into the batter. The air bubbles in your butter help your baked goods expand when baked and keep your cakes light, tender and soft. It also ensures that cakes don't shrink too much after they leave the oven.

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- very cold butter is used in recipes where you *don't* want the butter to combine with the rest of the ingredients; you want it to stay cohesive. Pie dough, puff pastry, biscuits, and scones all typically call for very cold butter so it remains intact and unincorporated, which leads to distinct layers in the finished baked goods. When the little chunks of butter that are infused in your dough get exposed to heat, they melt and the water in the butter evaporates. As the water evaporates, it lifts the pastry, creates layers in the dough, and makes it flaky.
- melted butter doesn't have the ability to aerate so it makes baked goods more dense and chewy. This is often used in brownies.
- to sauté is to cook food quickly in a minimal amount of fat over relatively high heat. The word comes from the French verb sauter, which means "to jump," and describes not only how food reacts when placed in a hot pan but also the method of tossing the food in the pan. The term also refers to cooking tender cuts of meat (such as chicken breasts or filet mignon) in a small amount of fat over moderately high heat without frequent stirring—just flipping it over when one side is browned.
- the browning achieved by sautéing lends richness to meats and produce. And because the food is cooked quickly, the integrity of the flavor and texture remains intact; asparagus, for example, retains its slightly grassy punch, as well as a pleasing crisp-tender bite.
- it's important to use either a skillet (a wide pan with sloped sides) or sauté pan (a wide pan with straight sides) for this technique. Both have a large surface area, so food is less likely to become overcrowded. Choose a pan with a dense bottom that evenly distributes heat. Nonstick, anodized aluminum, and stainless steel options work well.
- sautéing is a basic cooking technique essential to many recipes. Soups and stews, for example, almost always begin with sautéed aromatics; sautéing browns the vegetables, which enhances the flavor of the soup. But it's also used to fully cook whole dishes—and do so quickly. Because it cooks food fast, sautéing keeps the flavors vivid. This is especially welcome with seasonal ingredients such as tender asparagus.
- whether it's meat or vegetables, time in the pan is brief, so it's important that the food be naturally tender. Cuts such as beef tenderloin, fish fillets, and chicken breasts are good candidates. Many tender vegetables, including baby artichokes, sugar snap peas, mushrooms, and bell peppers, lend themselves to this technique.
- cutting food to a uniform thickness and size ensures that it will cook evenly. Vegetables should be no larger than bite-sized, meat no larger than portion-sized.
- it's important to warm the pan over medium-high heat for a few minutes. It needs to be quite hot in order to cook the food properly. If the heat is too low, the food will end up releasing liquid and steaming rather than sautéing.
- fats such as butter, oil, or bacon fat are used to coat the food and prevent it from sticking to the pan, aid in browning, and add flavor. Once the pan is hot, add the fat, and swirl to coat the bottom of the pan. (Heating the fat with the pan may cause food to stick.) Heat the fat for 10 to 30 seconds—until oil shimmers or butter's foam subsides—and then add the food.
- in general, it's important to use fats that have a high smoke point—peanut oil, regular olive oil, canola oil, or rendered pork fat. Oils that have low smoke points, like extra-virgin olive oil and many nut and infused oils, lose their characteristic taste when heated to sautéing's high temperatures. It's OK to sauté with these oils—just remember that their flavor will not be as pungent.
- it's important to not overcrowd when sautéing: It's crucial that only one layer of food cooks in the pan at a time. When sautéing cuts of meat, there should be at least a half-inch between each piece. Food releases steam when cooking. If that steam doesn't have enough room to escape, it stays in the pan, and the food ends up steaming rather than sautéing and won't brown.
- when sautéing tender vegetables and bite-sized pieces of meat, it's important to stir frequently (but not constantly) to promote even browning and cooking.
- stir-frying and sautéing are techniques that share some similarities. Both methods cook food quickly in a small amount of fat. But stir-frying cooks food over intensely high heat, stirring constantly. Sautéing involves only moderately high heat, and the food is not in continuous motion.
- a roux is a cooked mixture of equal parts flour and fat. When flour is cooked in fat, the fat coats the flour's starch granules. This helps keep lumps from forming when the roux is combined with liquid such as milk or stock, yielding a silky-smooth, uniform sauce. Butter is commonly used as a fat, but other fats that may be used include oil, lard or rendered fat such as bacon, or pan drippings from a piece of roasted meat.
- there are several categories of roux: light roux (white and blonde roux), brown roux and dark roux. Different types of roux result depending on how long the flour and fat are cooked; the type of roux made depends on whether it will act more as a thickening agent or to impart flavor.
- white and blond roux are cooked for just enough time to eliminate the raw taste of the flour, but not so long that the roux starts to brown, about 3 to 5 minutes. White roux is used to thicken sauces such as béchamel, cheese sauces and white gravy, as well as creamy soups and chowders.
- brown and dark roux are cooked for longer and have more flavor. The longer the roux is cooked, the darker in color it gets and the more its toasty, nutty aromas and flavors will come out. A roux starts to brown after

about 6 or 7 minutes. Brown roux is classically used in perfect gravies. Dark roux is cooked longer, about 8 to 15 minutes, and is commonly used in Creole and Cajun cuisine to flavor dishes such as gumbo or jambalaya. Brown and dark roux are typically runnier in consistency and have less thickening properties than white or blond roux.

- corn starch can be used as a substitute for flour in a roux.
- spherification is the process of creating a gel around a liquid forming a gelled sphere with a liquid center. The molecules typically used for this technique are calcium and potassium. The two types are direct and reverse spherification. Direct spherification involves the membrane being made of a flavored base so it has more pure flavor. The reverse process allows for a liquid center that will remain liquid for a longer period of time and the spheres are bigger.
- nitrogen fixation is the process plants undergo in order to make the nitrogen around them usable. They do this with the help of bacteria that are found in the roots. The bacteria synthesizes the nitrogen in the surrounding air into an organic form the plant can use. Nitrogen is a key component in proteins which means legumes, which can easily fix nitrogen because of their symbiotic relationship with bacteria, are a great source of protein. When humans eat the legumes, the protein is then transferred so the process of nitrogen fixation ultimately helps humans.

Students will be able to:

- explain the difference between an atom, molecule, mixture, and solution
- explain what an emulsion is and the importance of emulsifiers in cooking.
- explain what a fat is and the difference between unsaturated, saturated, trans, and polyunsaturated fats.
- explain what butter is, its function, the types, and what they are best used for in cooking and baking.
- explain what it means to sauté and the process of sautéing.
- explain what a roux is, the types of roux, and their function in cooking.
- explain the process of spherification and how it is used in cooking.
- explain the importance of nitrogen fixation in legumes.

## Core Learning Activities

Generalization 1:

1. Mousse - leavening (air) and emulsion - investigating air as a leavening agent
2. Making fudge - investigating sugar
3. Making cotton candy - investigating sugar
4. Mac and Cheese Activity - observe the magic of a roux.
5. Making Fried Rice - saute technique
6. Making Soft Pretzels - investigation flour/gluten
7. Gluten and Dairy Free Brownies- gluten and dairy free
8. Making Toll House cookies- culminating activity

## Assessments



[Assessments](#)

## Resources

*Professional & Student*

[Lipid Molecules - Introduction](#)

[Biochemistry in the news: trans fatty acids](#)

[Baking School Day 6: All About Butter and Baking](#)

[What does butter do in baking?](#)

[The surprising science of butter](#)

[cooking class: sauteing](#)

[How to make a roux - Food Network](#)

## Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

## Interdisciplinary Connections

This work has a connection to 6th grade curriculum as it involves discussion of atoms, molecules, mixtures, and solutions. It also connects to math when measuring and to literacy when students analyze data and explain the science behind what they observe.

In addition, there is a connection to the high school culinary courses in that the students are learning about the function of fat/butter in cooking and baking. This they will use if they take the culinary courses in high school.



# Unit Planner: Food Preservation Kitchen Science Gr. 8

Unit Planner: Food Preservation  
Kitchen Science Gr. 8

Newtown Middle School / 2022-2023 / Grade 8 / Science / Kitchen Science  
Gr. 8 (Pilot) / Week 1 - Week 20

Last Updated: Tuesday, May 2, 2023 by  
Elizabeth Iacofano

## Food Preservation

Bradley, Nancy; Iacofano, Elizabeth

- [Unit Planner](#)
- [Lesson Planner](#)

### Concept-Based Unit Development Graphic Organizer (Download)

#### Unit Web Template (Optional)

#### Concepts / Conceptual Lens

*Please attach your completed Unit Web Template here*

Lens: Change

Concepts: Structure, Process, Growth, Function, Health

G

#### Generalizations / Enduring Understandings

1. Following specific processes for preserving, storing, and cooking food reduces the likelihood of bacterial growth which helps maintain health.
2. Sterilization of equipment is a critical process used to prevent the growth of microorganisms when canning.

#### Guiding Questions

*Please identify the type of question: (F) Factual, (C) Conceptual, (P) Provocative [Debatable]*

- 1a. What is the function of food preservation? (F)
- 1b. What are the most common ways to preserve food? (F)
- 1c. What is the purpose of pasteurization?(F)
- 1d. What happens to food when heated and how does this relate to prevention of illness from a microorganism? (C)
- 1e. Why is refrigeration/freezing important when safely storing food? (C)
- 1f. What is fermentation and how does it preserve food? (C)
- 1g. What is the purpose of salt or sugar curing?(C)
- 1h. How does irradiation preserve food? (C)
- 1i. What role do alcohol, olive oil, and vinegar play in food preservation? (C)
- 1j. Is bacteria good or bad? Why? (P)

- 2a. How does one safely can food? (F)
- 2b. Why is it important to properly can food? (C)

**Standard(s)**

*Connecticut Core Standards / Content Standards*

**CCSS: Literacy in History/Social Studies, Science, & Technical Subjects 6-12**

**CCSS: Grades 6-8**

**Capacities of the Literate Individual**

**Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, & Language**

They demonstrate independence.

They build strong content knowledge.

They value evidence.

They use technology and digital media strategically and capably.

**Reading: Science & Technical Subjects**

**Key Ideas and Details**

**1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.**

RST.6-8.1. Cite specific textual evidence to support analysis of science and technical texts.

**Writing**

**2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.**

WHST.6-8.2e. Establish and maintain a formal style and objective tone.

**Production and Distribution of Writing**

**4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.**

WHST.6-8.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

**Research to Build and Present Knowledge**

**7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.**

WHST.6-8.7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

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**Critical Content & Skills**

*What students must KNOW and be able to DO*

## Generalization 1

Students will know that:

- the most common methods to preserve food are drying, refrigeration, fermentation, canning, pasteurization, freezing, irradiation, and the adding of chemicals (sugar/salt curing, alcohol, vinegar, olive oil). These all serve the function of reducing the growth of microorganisms. The principal objective of food preservation is to increase its shelf life retaining original nutritional values, color, texture, and flavor.
- before cooking food, it is filled with microorganisms (bacteria and fungi) that can be harmful if ingested. Small amounts of heat can cause the proteins within the microorganisms to malfunction and the organism dies. Most live and multiply in a temperature range of a few degrees above freezing to 122 degrees F. At cooler temperatures, it is too cold for microbes to survive and grow. This is why freezing and refrigeration are effective ways to preserve food.
- drying foods inhibits the growth of bacteria, yeasts, and mold through the removal of moisture content. Electric food dehydrators, ovens, and freeze-drying are now speeding up the process that was traditionally done by sun and air. Foods that dehydrate well are fruits, vegetables, legumes, spices, meat, and fish. Dry rice does not go bad but cooked rice does because it contains water and organisms grow in wet environments.
- cold food storage (refrigeration) is the simplest food preservation method. It occurs in refrigerators and cool, dark places such as root cellars, unheated basements, and pantries. Cooling preserves food by slowing down the growth of microorganisms that cause the food to spoil.
- fermentation is a process where food is produced with the help of microbes (yeast and some bacteria). Fermentation is widely spread across cultures and has been for a very long time. The reason is the preservative properties that can be achieved with the right microbes. In the time before refrigerators and freezers, fermentation was critical to ensuring a healthy food supply. Fermentation comes in two forms: alcohol production by yeast (examples: bread, wine) and lactic acid generation from bacteria (example: sauerkraut). In sauerkraut, salt is added to cabbage, mixed well, and tightly packed in a jar in order to get rid of all the air and make the environment free of oxygen. It's important to make sure the cabbage is covered by the brine (salt solution). The lactic acid bacteria present in the cabbage produce lactic acid, which is toxic to harmful bacteria but not to themselves. This makes them grow better which makes the environment even more acidic thereby killing more harmful bacteria. Slowly, the lactic acid bacteria have created an environment where they can dominate and hog the food source. As a result, harmful spoilage bacteria cannot grow.
- pasteurization involves adding just enough heat so the microbes die but the food remains unaltered. The higher the temperature, the shorter the time and vice versa.
- freezing foods uses little specialized equipment, while preserving fresh flavors and textures. Freezing slows the growth of microorganisms and enzymes that can cause food spoilage. For the best results, freeze room-temperature foods, remove all the air from the freezer bag, and consume within 6 months of freezing. Sealing frozen produce in vacuum-sealed bags prevents ice crystals from forming and can extend the shelf life of food. Freeze-drying is a low-temperature dehydration process that involves freezing food and removing the ice by sublimation—turning ice into vapor. This method can be done in a freezer (takes several weeks), on dry ice, or using a modern freeze-dryer unit, which can take less than 24 hours.
- food irradiation (the application of ionizing radiation to food) is a technology that improves the safety and extends the shelf life of foods by reducing or eliminating microorganisms and insects. Like pasteurizing milk and canning fruits and vegetables, irradiation can make food safer for the consumer. Irradiation does not make foods radioactive, compromise nutritional quality, or noticeably change the taste, texture, or appearance of food. In fact, any changes made by irradiation are so minimal that it is not easy to tell if a food has been irradiated.
- the purpose of irradiation is to effectively eliminate organisms that cause foodborne illness, such as *Salmonella* and *Escherichia coli* (*E. coli*), preservation – to destroy or inactivate organisms that cause spoilage and decomposition and extend the shelf life of foods, insect control - to destroy insects in or on tropical fruits imported into the United States. Irradiation also decreases the need for other pest-control practices that may harm the fruit, delay of sprouting and ripening – to inhibit sprouting (e.g., potatoes) and delay ripening of fruit to increase longevity.
- before industrial refrigeration, most foods were cured using sugar, salt, or a mixture of both. Salt and sugar reduce the water content and inhibits microbial growth in meats, fruits, and vegetables aiding in preservation. Common sugar-preserved foods are jams and jellies, while salt cod, salt pork, corned beef, and bacon are common foods preserved with salt.
- fruit has a long history of getting preserved in alcohol. During the eighteenth century in Europe, fruits like peaches, cherries, and apricots were submerged in brandy and served as dessert after a meal. Alcohol

draws water out of food, similar to salt and sugar, inhibiting microbial growth.

- vinegar pickling creates a high acid environment that kills off microbes and causes food to change in flavor and texture. Vinegar, salt, and sugar are heated and added to fruit or vegetables to make pickles of cucumber, okra, apples, beets, peppers, carrots, onions, cauliflower, green beans, and plums.
- extra-virgin olive oil is a natural preservative that prevents spoilage by isolating food from air, providing a seal that can slow down oxidation and molding. It is used for preserving fresh herbs, vegetables, and fish. It's important to keep food safety in mind when storing vegetables such as garlic, mushrooms, chili peppers, or herbs in oil—these low-acid foods can be a source of bacteria and should be stored in the refrigerator as a precaution.

Students will be able to:

- identify the methods to preserve food
- explain the overall function of preserving food
- explain each method to preserve food and its specific purpose

## Generalization 2

Students will know that:

- canning is the process involves placing foods in canning jars and heating them to a high temperature to destroy the microorganisms that cause food to spoil. During the heating process, air is pushed out of the jar, and as the cans cool, a vacuum seal forms. Canning in a bath of boiling water is ideal for high-acid foods, like fruits and fruit juice, pickled vegetables, salsa, chutneys, vinegars, and condiments. Water bath canning requires extended cooking time at a low temperature to destroys the mold, yeast, and enzymes that cause spoilage while making a vacuum seal for long-term storage. The second primary type of home canning, pressure canning uses high temperatures (240°F) and special equipment to preserve low-acid foods, like vegetables, dairy, meat and seafood, legumes, and soups.

Students will be able to:

- explain the purpose of canning safely

## Core Learning Activities

Generalization 1 and 2: The way the students learn this content is by completing a long-term research assignment.

Research assignment:

food preservation research assignment - students are given a choice of product: can be done as a slide show or they can create a model.

## Assessments

[8 Food Preservation Research Assignment](#)

## Resources

### *Professional & Student*

#### Books:

The Food Safety Book by Joe Kivett and Dr. Mark Tamplin with Dr. Gerald J. Kivett, Copywrite 2016

#### Websites:

[How to sterilize canning jars using boiling water](#)

[Natural Center for Food Preservation](#)

[Guide to Food Preservation](#)

[Food Irradiation: What You Need to Know.](#)

## Student Learning Expectation & 21st Century Skills

[Information Literacy](#)

[Critical Thinking](#)

[Spoken Communication](#)

[Written Performance](#)

## Interdisciplinary Connections

This unit connects to literacy when students explain the science behind what they observe and to health when discussing food preservation.





## Newtown Public Schools DEAI Commitment



Diversity, Equity and Inclusion are words that, when used together, describe policies and programs that promote the representations, participation and contributions of different groups of individuals as set forth in Policy 0523 Equity and Diversity including but not limited to people of different race, culture, religion, mental and physical ability, sexual orientation, or gender expression or identity.

More specifically:

- Schools should be welcoming and supportive spaces for our students.
- Our curriculum should be infused with materials that include diverse authors, protagonists, heroes and historical figures.
- When studying topics in our classroom, our students will learn through multiple lenses and points of view.
- Schools should embrace kindness and diversity. Any form of harassment or bullying based on personal characteristics, as enumerated above, will not be tolerated.

As educators, we need to provide various perspectives on topics and remain apolitical. To encourage critical thinking, we need to develop learning environments that allow students to identify and understand perspectives provided in the material and related discussions, and to draw their own informed conclusions. That is where true learning occurs.





# Newtown Public School District

**Strategic Plan**

**May 30, 2023**



# Newtown Public School District

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# Newtown Public School District

Dear Parents, Students, Staff, and Community Members,

I am delighted to present to you the Newtown Public Schools Strategic Plan, a roadmap that will guide our collective efforts towards an exceptional education for all our students. Beginning in November of 2022, the Newtown Board of Education launched a strategic planning process designed to solicit input from various stakeholders including, students, parents, educators, community members and experts. Through surveys, focus groups and individuals, we learned about your current experiences of the school district as well as your hopes for the future. Through the winter and spring of 2023, the Strategic Planning Committee carefully analyzed the diverse perspectives of our community, considering strengths, challenges, and aspirations for the future.

At the core of our plan is the unwavering commitment to ensuring all students graduate prepared to succeed in life. With your assistance, we have articulated a Portrait of the Graduate; a vision of the skills and dispositions necessary to thrive after graduation. This will be our North Star, shining a light and providing clarity of purpose. We have also identified four strategic priorities that will help guiding efforts in the coming years:

- Strategic Priority 1: Ensure Stimulating, Engaging, and Challenging Learning Opportunities Tailored to the Individual Needs of Students
- Strategic Priority 2: Prepare Students for Life Beyond Graduation
- Strategic Priority 3: Hire, Retain, and Develop a Diverse and Exceptional Faculty and Staff
- Strategic Priority 4: Strengthen District, Family, and Community Partnership

At Newtown Public Schools, we are committed to providing an exceptional educational experience that empowers students to thrive academically, socially, and personally. Our strategic plan serves as a roadmap for achieving our mission and guiding our actions as we strive for continuous improvement and excellence.

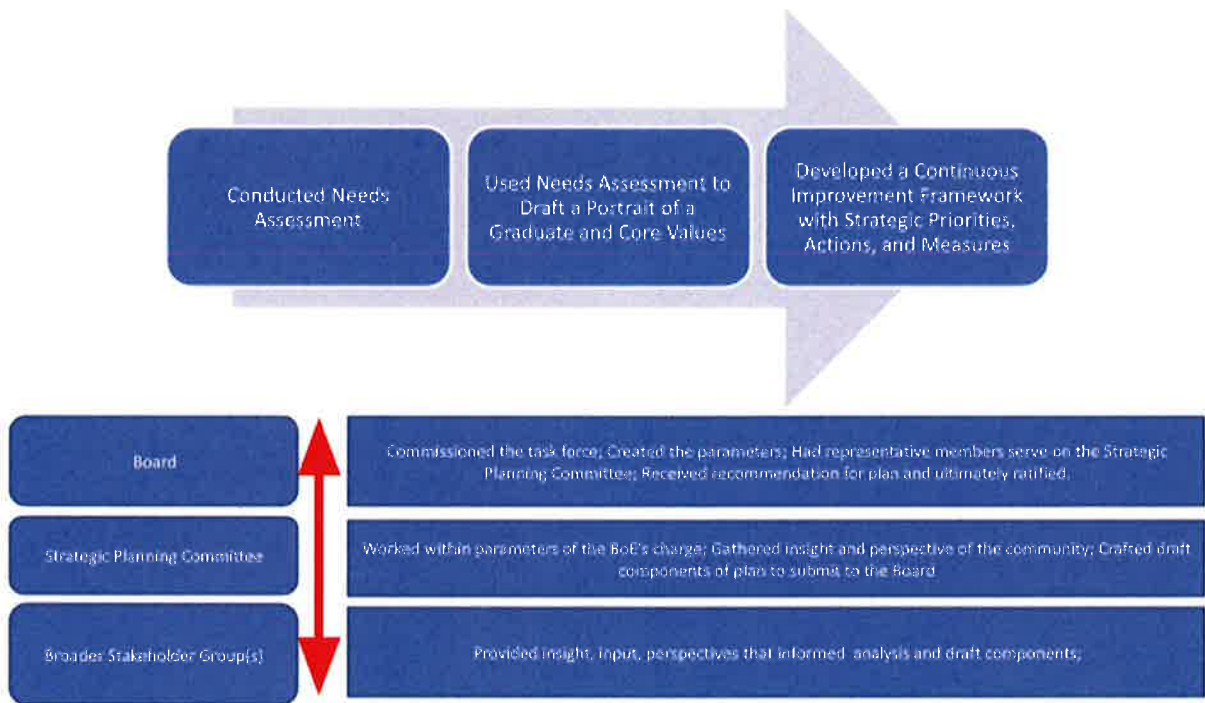
I invite you all to join us on this exciting path as we work towards realizing our shared vision of academic excellence, student well-being, and community engagement. Together, we will make a positive and lasting impact on the lives of our students and the future of our community.

Sincerely,



# Newtown Public School District

## Newtown Strategic Planning Process







# Newtown Public School District

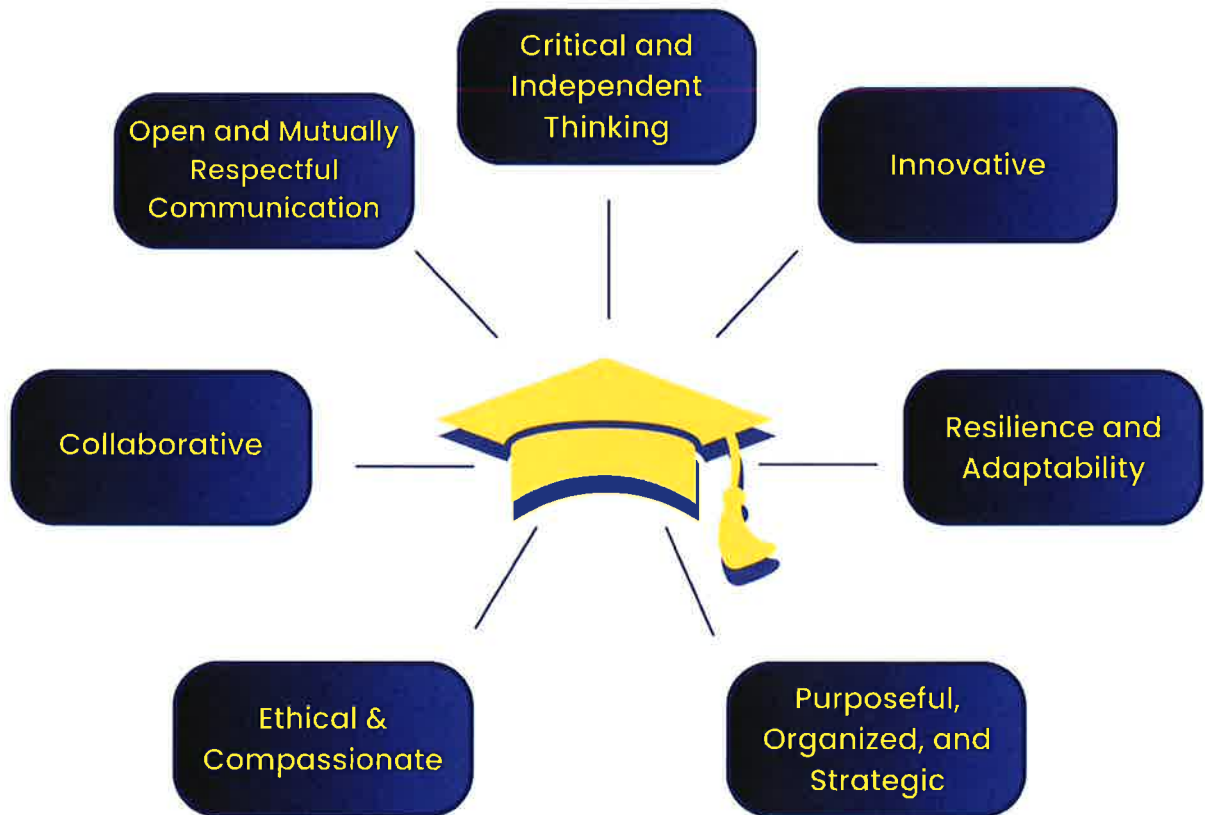
## Portrait of the Newtown Graduate

Dimension	
Critical and Independent Thinking	<ul style="list-style-type: none"> <li>● Processes, analyzes, examines, interprets, and evaluates information to form an opinion and make decisions</li> <li>● Questions, discusses, and explores varying ideas and viewpoints</li> </ul>
Innovative	<ul style="list-style-type: none"> <li>● Demonstrates a sense of curiosity</li> <li>● Uses imagination to identify novel solutions to existing challenges</li> <li>● Explores the unknown</li> </ul>
Resilience and Adaptability	<ul style="list-style-type: none"> <li>● Perseveres and adapts to challenges</li> <li>● Learns and grows from setbacks and challenges</li> <li>● Exhibits flexibility in changing situations</li> </ul>
Purposeful, Organized, and Strategic	<ul style="list-style-type: none"> <li>● Identifies and pursues goals</li> <li>● Assesses complex challenges and identifies appropriate strategies</li> <li>● Monitors progress and adjusts approaches as necessary</li> </ul>
Ethical & Compassionate	<ul style="list-style-type: none"> <li>● Displays empathy and regard for others</li> <li>● Fosters a caring community</li> <li>● Seeks to understand the perspectives of others</li> <li>● Seeks to serve others and the community</li> <li>● Acts with integrity in accordance with defined principles</li> </ul>
Collaborative	<ul style="list-style-type: none"> <li>● Works interdependently and respectfully with others to enhance learning and achieve common goals</li> <li>● Respects divergent thinking and works with others in productive discussion</li> <li>● Partners with others possessing varying backgrounds and experiences</li> <li>● Welcomes feedback from others to enhance quality of work</li> </ul>
Open and Mutually Respectful Communication	<ul style="list-style-type: none"> <li>● Listens to and seeks to understand the ideas, thoughts, and opinions of others</li> <li>● Articulates ideas effectively in varying modes and media</li> <li>● Understands and tailors communications to the audience and the intended purpose</li> </ul>





## PORTRAIT OF THE NEWTOWN GRADUATE





# Newtown Public School District

## Core Values of the Newtown Public Schools Community

	<b>We are committed to:</b>
Respect	Valuing and Maintaining Positive Regard for Others
Inclusion, Belonging, and Diversity	A compassionate, community-minded climate that embraces and honors the needs and contributions of all.
Integrity	Displaying ethical conduct in every decision and practice.
Excellence Through Continuous Improvement	A disciplined, rigorous and dynamic pursuit of improvement for students and staff.
Innovation	Exploring, researching and investigating new solutions and opportunities.
Collaboration	Working together respectfully and supporting each other in pursuit of common purpose.
Safety	Ensuring the physical and emotional well-being of all.



## CORE VALUES





# Newtown Public School District

## **Newtown Board of Education's Statement on Diversity, Equity and Inclusion**

Diversity, equity and inclusion are words that, when used together, describe policies and programs that promote the representations, participation and contributions of different groups of individuals as set forth in [Policy 0523 Equity and Diversity](#) including but not limited to people of different race, culture, religion, mental and physical ability, sexual orientation, or gender expression or identity.

More specifically:

- Schools should be welcoming and supportive spaces for our students.
- Our curriculum should be infused with materials that include diverse authors, protagonists, heroes and historical figures.
- When studying topics in our classroom, our students will learn through multiple lenses and points of view.
- Schools should embrace kindness and diversity. Any form of harassment or bullying based on personal characteristics, as enumerated above, will not be tolerated.
- As educators, we need to provide various perspectives on topics and remain apolitical. To encourage critical thinking, we need to develop learning environments that allow students to identify and understand perspectives provided in the material and related discussions, and to draw their own informed conclusions. That is where true learning occurs.



## **STRATEGIC PRIORITIES**

**01**

**Ensure Stimulating, Engaging,  
and Challenging Learning  
Opportunities Tailored to the  
Individual Needs of Students**

**02**

**Prepare Students to Thrive Post-  
graduation**

**03**

**Hire, Retain, and Develop a  
Diverse and Exceptional Faculty  
and Staff**

**04**

**Strengthen District, Family, and  
Community Partnership**



# Newtown Public School District

## Strategic Priority 1:

### Ensure Stimulating, Engaging, and Challenging Learning Opportunities Tailored to the Individual Needs of Students

Strategic Actions	Measures of Progress
<p>Making learning experiences that are culturally responsive, rigorous, and personalized</p>	<ul style="list-style-type: none"> <li>● Learning Walks and other types of non-evaluative classroom visits</li> <li>● Annual performance on benchmark assessments</li> <li>● Student/Family Survey</li> </ul>
<p>Increase opportunities for inquiry-based and student-centered learning that promotes curiosity and student engagement</p>	<ul style="list-style-type: none"> <li>● Student/Family Survey</li> <li>● Learning Walks and other types of non-evaluative classroom visits</li> <li>● Annual performance on benchmark assessments</li> </ul>
<p>Use data and evidence to drive instructional decision making to meet the individual needs of our students</p>	<ul style="list-style-type: none"> <li>● Annual performance on benchmark assessments</li> <li>● Number of students receiving interventions- in and dismissed</li> <li>● Annual review of data use for driving instruction</li> </ul>
<p>Create learning experiences that support students in identifying and understanding perspectives provided in materials and related discussions, and to draw their own conclusions.</p>	<ul style="list-style-type: none"> <li>● Learning Walks and other types of non-evaluative classroom visits</li> <li>● Annual performance on benchmark assessments</li> <li>● Student/Family Survey</li> <li>● Non-evaluative classroom visits</li> <li>● Analysis of curricular shifts within ongoing curriculum review process</li> </ul>



# Newtown Public School District

## Strategic Priority 2: Prepare Students to Thrive Post-Graduation

Strategic Actions	Measures of Progress
Make available to students a variety of resources and options for post high school pursuits.	<ul style="list-style-type: none"><li>● Exit surveys and interviews (sampling strategy) of graduating seniors</li><li>● College and Career Center participation metrics</li><li>● Student interest survey</li></ul>
Provide authentic experiences aligned to post-graduate possibilities/opportunities.	<ul style="list-style-type: none"><li>● Capstone topics for graduating seniors</li><li>● End-of-capstone survey</li></ul>
Create a comprehensive plan to help all students achieve the portrait of the graduate, including an assessment process	<ul style="list-style-type: none"><li>● Completion of the plan</li><li>● Implementation of plan at school levels</li></ul>
Expand opportunities for students to explore career pathways and to develop marketable skills	<ul style="list-style-type: none"><li>● Exit surveys and interviews (sampling strategy) of graduating seniors</li><li>● College and Career Center participation metrics</li><li>● Participation rates in career pathway opportunities</li></ul>



# Newtown Public School District

## Strategic Priority 3:

### Hire, Retain, and Develop a Diverse and Exceptional Faculty and Staff

Strategic Actions	Measures of Progress
Analyze climate surveys to identify needs and develop school-specific action steps to address results	<ul style="list-style-type: none"><li>● Existence of school annual plans</li><li>● Progress toward addressing identified needs</li></ul>
Diversify applicant pool by strategic recruitment	<ul style="list-style-type: none"><li>● Creation of a comprehensive recruitment system</li><li>● Annual summary of applicant diversity statistics</li></ul>
Provide mentoring support for all new hires	<ul style="list-style-type: none"><li>● Annual survey of new teachers and mentors</li><li>● Annual retention rates</li></ul>
Create comprehensive professional development plan to address needs at the individual, school and district levels	<ul style="list-style-type: none"><li>● Professional development priorities articulated in annual improvement plans</li><li>● Professional development impact results</li></ul>





# Newtown Public School District

## Strategic Priority 4: Strengthen District, Family, and Community Partnership

Strategic Actions	Measures of Progress
Enhance communications to stakeholders to encourage timely and effective information flow using various methods.	<ul style="list-style-type: none"><li>● Parent survey results, disaggregated by school</li><li>● Annual communications plan that articulates priorities, strategies and timetables</li></ul>
Rebuild district website to optimize communications with stakeholders	<ul style="list-style-type: none"><li>● Completion and launch and website</li><li>● Website view statistics</li><li>● Participation rates for family programming events</li></ul>
Revitalize family advisory groups at the school and district levels to enhance engagement, problem-solving, and feedback.	<ul style="list-style-type: none"><li>● Articulated charter of advisory groups</li><li>● Parent survey results, disaggregated by school</li></ul>
Build capacity within the district and community to support diversity, inclusion, accessibility and belonging.	<ul style="list-style-type: none"><li>● Completed needs assessment by consultant.</li><li>● Implementation of recommendations from consultant.</li></ul>



# Newtown Public School District

## Newtown Continuous Improvement Process

The Newtown Public Schools Strategic Plan is a tool to clarify priorities and promote focused and sustained improvement efforts over time. To operationalize the Strategic Plan, NPS will engage in an annual process of study, plan, act, and do.

Each year:

- NPS and the board will review progress from the previous year and identify annual goals in alignment with the Strategic Plan.
- School leadership teams will examine results from the previous year and identify school-based goals in alignment with the Strategic Plan.
- The Communications Committee of the NPS Board of Education will publish highlights of progress aligned with the Strategic Plan.
- The Strategic Planning Committee meets three times per year to review progress, examine data, provide updates to the Communications Committee, and identify necessary adjustments.
- NPS Superintendent will provide the Board of Education updates three times per year in alignment with Strategic Planning Committee Meeting reviews.
- Family Advisory Groups will be invited to board meetings for strategic plan progress updates.

*Existing policy, presently numbered 4-302 adopted 10/10/95, appropriate as renumbered except for update to legal reference.*

## **Personnel -- Non-Certified**

### **Evaluation of School Nurses**

All full-time and part-time nurses employed by the Board of Education shall be evaluated annually as to their overall performance. ~~The evaluation shall be made by the school building administrator or his/her designee with assistance from the School Health Nurse Supervisor.~~ **The evaluation shall be made by the district nursing supervisor in collaboration with the school building administrator or his/her designee.**

The evaluation shall be in writing and pertain to relationships with students, parents, staff members, ~~teachers,~~ and administration as well as to knowledge, competency, overall performance, and fulfillment of required State Department of Health and State Department of Education mandates.

**Legal Reference:** **Connecticut General Statutes**

**10-212 School nurses and nurse practitioners**

Policy adopted:

NEWTOWN PUBLIC SCHOOLS  
Newtown, Connecticut

**Board of Education  
Newtown, Connecticut**

Minutes of the Board of Education meeting held on May 16, 2023, at 7:00 p.m. in the Council Chambers, 3 Primrose Street.

D. Zukowski, Chair	C. Melillo
J. Vouros, Vice Chair	A. Uberti
D. Ramsey, Secretary (absent)	T. Vadas (absent)
D. Cruson	25 Staff
J. Kuzma	250 Public
J. Larkin	4 Press
A. Plante	
K. Kunzweiler (absent)	
D. Godino (absent)	

Ms. Zukowski called the meeting to order at 7:00 p.m.

Item 1 – Pledge of Allegiance

Item 2 – Public Participation

Ms. Zukowski said that Mr. Ramsey has critical family concerns which is why he couldn't attend the meeting.

Please click [here](#) to view the public participation.

Kenneth Milare, spoke about book challenges.

Serena Arokium, spoke about diversity and inclusion and book challenges.

Skyler Lewis spoke about book challenges.

Ashley Hubner spoke about book challenges.

Susan Chanko, 28 Canterbury Lane, spoke about book challenges.

Joseph Crosby spoke book challenges and thanked faculty members for being there.

Ben Kugielski, 5 Surrey Drive, spoke about fascism.

El Glassman spoke about book challenges.

Lynn Edwards, 3 Sand Hill Road, spoke about book challenges.

Steve Linden, 25 Horseshoe Ridge Road, questioned the vote with one member missing.

Dan Grossman, 62 Pine Tree Hill Road, spoke about book challenges.

Chris Gilson, 38 Osborne Hill Road, spoke about book challenges.

Karyn Holden, 68 Berksire Road, supports all administrators, staff and students and the Board should too.

Bruce Degan, 62 Castle Meadow Road, illustrator of *The Magic School Bus*, stated that teachers and school librarians in this country are dedicated to children and take care in the books they present.

Wesley Johnson, 65 Britannica Drive, Danbury, spoke about book challenges.

Steve Landau, 8 Walnut Tree Hill Road, spoke about book challenges.

Matt Bracksiek, 65 Walnut Tree Hill Road, spoke about book challenges.

Michelle Embree Ku, 28 Platts Hill Road, read a letter from the *Flamer* author, Mike Curato, who requested that it be read.

Timothy Stan, 6 Monitor Hill Road, spoke about book challenges.

Derek and Dee Pisani, Parmalee Hill Road, spoke about book challenges.

Treasa O'Sullivan spoke about book challenges.

Lia Mayer, 49A Flat Swamp Road, spoke about book challenges.

Katherine Lye spoke about book challenges.

Beatrice Cardamone, spoke about book challenges.

Olivia Pease lives in 14 Winding Road, Bethel, spoke about book challenges.

Nerlande Foote, 14 Bear Hills Road, spoke about book challenges.

Christine Miller, 72 Forest Drive, spoke about the qualifications for Newtown educator Abi Marks who was on the special review committee. She has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Laura Miller, 8 Diamond Drive, spoke about Newtown educator David Foss who served on the special review committee. He has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Heather Dean, 4 Lyrical Lane, spoke about the expertise of Newtown educator Liza Zandonella who served on the special review committee. She has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Laura Main, 42 The Old Road, spoke about qualifications of Newtown High School Principal Dr. Kim Longobucco who served on the special review committee. She has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Doria Linnet, 27 Littlebrook Lane, spoke about Assistant Superintendent Anne Uberti who presented the results of the special review committee. She has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Betsy Licht, 86 Great Hill Road, spoke about Superintendent Chris Melillo who has advised the Board to uphold the special review committee's unanimous recommendation to keep the books in the Newtown High School library. He has the training and expertise in a way this Board of Education does not. A vote against the special review committee is a vote against the experts and a vote against educators.

Nicole Maddox, 14 Nighthawk Lane, spoke about book challenges. A vote against the special review committee is a vote against the experts and a vote against educators.  
Jessica Galterio, 8 Surrey Trail, spoke about book challenges

Keith Alexander, 8 Fawnwood Road, former board member, said it was important the public speaks. The Board's job is not micromanagement. Reviewing books through a committee is why you hire educators.

Mary Murphy, 25 Church Hill Road, spoke about book challenges.

Paul Lundquist, 141 Currituck Road, spoke about book challenges.

Jim Gaston, 18 Main Street, spoke about book challenges and possible violations of the 1<sup>st</sup> and 14<sup>th</sup> Amendments if you ban these books. The Board took an oath to support the Constitution of the United States, the Constitution of the State of Connecticut, and the Charter of Newtown. Don't violate your oaths.

Item 3 – Discussion and Possible Action on Citizen's Requests for Reconsideration of Library Media Materials

MOTION: Mr. Cruson moved that the Board of Education accept the recommendation of the Special Review Committee that the book *Flamer* remain in circulation in the Newtown High School Library. Mrs. Plante seconded.

MOTION: Mrs. Kuzma moved to postpone the vote until no later than June 5. Mrs. Larkin seconded.

Mr. Melillo spoke to the audience and stated that conversations tonight need to be civil. He thanked everyone for coming to the meeting but we have to allow people to speak.

Mrs. Kuzma felt this requires the vote of the full Board and every one of them has the chance to be heard.

Mr. Cruson stated this is causing disruption to the district and stress and anguish to Board members and feels we should vote tonight.

Mrs. Plante agreed with Mr. Cruson as we have a quorum to vote. She would not support the amendment.

Mr. Vouros said we should vote with the intent to come to a compromise or solution. Let it unfold with the proper discussion it needs.

Vote on motion to postpone the vote: 1 aye, 5 nays (Ms. Zukowski, Mr. Vouros, Mr. Cruson, Mrs. Larkin, Mrs. Plante) Motion fails.

Mr. Cruson provided comments on the book *Flamer*. If we vote against the committee it will be harder to put people in these positions. He spoke about the Miller test for books. His reaction to *Flamer* does not meet the criteria for not being in the school libraries. A vote to remove it is not in the best interest of Newtown Public Schools.

MOTION: Mrs. Kuzma moved to amend the motion to add "provided that access to the books by students 16 and younger be allowed only with written consent of their parent or guardian." The full motion would read "Move that the Board of Education accept the recommendation of the Special Review Committee that the book *Flamer* remain in circulation in the Newtown High School Library provided that access to the books by students 16 and younger be allowed only with written consent of their parent or guardian." Mrs. Larkin seconded

Mrs. Kuzma was concerned about recent phone calls with community members and staff for fear of retaliation when sharing their input. For anyone to imply that a parent who advocates for their child for what they feel is right should not be labeled anti-educators. She supports educators. She is not anti-lgbtq. She takes her position seriously and was elected to reflect many voices. This amendment is a compromise to satisfy both ends of the issue. This will allow parents to see the books first and she hopes we can come to a compromise.

Mrs. Larkin supports the amended motion and to give the decision back to the parents. She supports the theme of the books. She urged fellow members to come to a compromise.

Mr. Cruson understands the concerns and the desire to come to a compromise but he doesn't feel this is the compromise that will work. Making parents opt in to the book is shaky legal grounds.

Mrs. Plante appreciates the attempt to compromise but she is uncomfortable with the restriction. This is more restrictive than we should be. Parents can opt out so it already exists. She won't support the amendment.

Mr. Vouros said it was important to recognize that parents have the ability to say what their children should and should not read and we have already established that they have the right to alert the teacher if they don't want their child to participate. It makes sense to let the parents make the decision. We all need to be comfortable that the experts we have are doing what they need to do and hope they let the parents decide on books so we can move on.

Mrs. Larkin said the decision making authority belongs to their parents. She can't support that anyone should make decisions for anyone else's child.

Mrs. Kuzma said part of the issue is that parents don't know these books exist so there are students who could thumb through them and have access to the books without their parents knowing.

Mr. Vouros said that doesn't happen in the middle school because students don't have time during class to look at a book. He can't speak for the high school.

Mrs. Plante said she is depending on the recommendation of the Special Review Committee. If some parents want to restrict books we have a mechanism to do that.

Ms. Zukowski agrees that *Flamer* is not obscene or pornographic but it does include explicit sexual content. Regarding students leafing through books a student did write and said she goes to the library during free periods. She also spoke about age appropriate content defined by the American Library Association. Graphic content is not appropriate for children 13 or 14 years old. She supports the amendment.

Ms. Zukowski asked three questions at the previous meeting which were what age is appropriate for sexually explicit material, how do we respect the different perspectives on sexual contents that parents may have, and are there books that provide comparable value that do not include sexually explicit content.

Mrs. Uberti said they were difficult questions and would speak to the library media specialists. Extensive time would be needed to search and read the content. The overriding opinion was that *Flamer* tells a unique autobiographical story that fits the time we live in and would be helpful to students.

Vote: 3 ayes, 3 opposed (Mr. Vouros, Mr. Cruson, Mrs. Plante) Amendment fails.

MOTION: Mrs. Larkin moved to amend the motion to add "provide access to the book by students 15 and younger be allowed only with written consent of their parent, with students 16, 17 and 18 to have unfettered access to the book." Mrs. Kuzma seconded.

Mrs. Larkin doesn't want to remove the book. There are parents who have concerns about this content.

Mrs. Plante said she was uncomfortable with the Board leading to operational areas where we don't have responsibilities. She won't agree to the amendment.

Mr. Cruson agreed and he is not comfortable with an opting process. There's a procedure in place under the operational jurisdictions.

Mrs. Kuzma said we have put in hours of time hearing concerns and no acknowledgement for parents who have concerns and would support the motion.

Vote on amendment: 3 ayes, 3 nays (Mr. Vouros, Mr. Cruson, Mrs. Plante) Motion fails.

Mrs. Larkin asked Board members if there was something they were comfortable with that we don't do to acknowledge books with extreme vulgarity. Why would we put these materials with vulgarity in the hands of the students. She cares about the First Amendment and we received legal advice around the First Amendment with explicit material in the book.

Mr. Vouros trusts that the parent will know what is best for their child. The best thing to do is to help parents who are uncomfortable with what we decide.

Mr. Cruson doesn't know if there is a compromise. He would not support another age opt in the motion. He is not in favor of banning books but understands the parental concerns for these two books.

Mrs. Uberti stated that there is an opportunity for parents to reach out to the library media specialists regarding issues with books. A compromise is expanding that to ask parents to provide us with a list of books parents don't want their child to see. What would provide clarity is if that is provided to all parents it would allow us to see what's next.

Ms. Zukowski said this is a compromise at the policy level for these two books. We can move to amend the motion by adding parents who wish to not access *Flamer* provide written notification not to access *Flamer* and notification to the library media specialists at the high school.

Vote on main motion: 3 ayes, 3 nays (Ms. Zukowski, Mrs. Kuzma, Mrs. Larkin) Motion fails.

MOTION: Mr. Cruson moved that the Board of Education accept the recommendation of the Special Review Committee that the book *Blankets* remain in circulation in the Newtown High School Library. Mrs. Plante seconded.

Mr. Cruson read his statement about *Blankets*. The Miller test was not satisfied and removing the book would not hold up legally.

Mrs. Plante read her statement. She believes we should not infringe on students rights. *Flamer* was never checked out by a student and *Blankets* was not checked out until this year. She consulted a crisis counselor and said none of her students were influenced by a book. Reading books is helpful for those contemplating suicide. Books are not obscene and not pornography. They have substantial literary value. Diverse perspectives are important to our students. She asked to listen to our experts.

Vote on motion: 3 ayes, 3 nays (Ms. Zukowski, Mrs. Kuzma, Mrs. Larkin) Motion fails.

Ms. Zukowski said in speaking with our lawyer, a tie means no action. The books stay on the shelf and we will have to have another meeting to decide.



Mr. Melillo said that without a consensus, the books are status quo. We will seek legal advice and have another Board meeting to come to a consensus.

Item 4 – Public Participation

Danielle Loser, 1 Grays Plain Road, spoke about book challenges.

Joseph Crosby spoke about book challenges.

Casey Ragan stated the Board is not supporting our teachers or the people in charge and should put students and staff first.

El Glassman, has not seen anyone checking out a book.

Linda O’Sullivan, 11 Farmery Road, spoke about book challenges.

Amelia Rivero, spoke about book challenges.

Sarah Beier, 7 Yogananda Street, spoke about book challenges.

Christine Wilford, 13 Georges Hill Road, spoke about book challenges.

Madison Albano, 8 Cobblers Mill, spoke about book challenges.

Dan Grossman, 62 Pine Tree Hill Road, spoke about book challenges.

Morgan Albano, 8 Cobblers Mill Road, spoke about challenges.

Brian Tenney, NHS English teacher, spoke about book challenges.

Lynn Edwards, 3 Sand Hill Road, spoke about book challenges.

Trent Harrison, 59 Platts Hill Road, teacher at Newtown High School, spoke about the Board bylaws and it was not their job to change the policy around book and should accept the committee’s decision.

Steve Hinden spoke about book challenges.

Treasa O’Sullivan spoke about book challenges.

Carrie Grummons spoke about book challenges.

Timothy Stan, 6 Monitor Hill Road, spoke about book challenges.

Jason Almeter, 122 Hanover Road, spoke about book challenges.

Edward Randall 86 Great Hill Road, spoke about listening to the young people.

Mary Murphy, 25 Churchill Road, spoke about book challenges.

MOTION: Mr. Vouros moved to adjourn. Mrs. Cruson seconded. Motion passes unanimously.

Item 5 – Adjournment

The meeting adjourned at 10:24 p.m.

Respectfully submitted:

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Deborra Zukowski  
Chair

**Please Note: These minutes are pending Board approval.**  
**Board of Education**  
**Newtown, Connecticut**

Minutes of the Board of Education meeting held on May 23, 2023, at 6:30 p.m. in the Reed Intermediate School Library, 3 Trades Lane.

D. Zukowski, Chair	C. Melillo
J. Vouros, Vice Chair	A. Uberti
D. Ramsey, Secretary (absent)	T. Vadas (absent)
D. Cruson	40 Staff
J. Kuzma (absent)	50 Public
J. Larkin (absent)	1 Press
A. Plante	
K. Kunzweiler	
D. Godino	

Item 1 – Executive Session

MOTION: Mr. Vouros moved that the Board of Education go into executive session to discuss a personnel request and invite Mr. Melillo. Mrs. Plante seconded. Motion passes unanimously. Executive session began at 6:30 p.m.

Ms. Zukowski called the meeting to order at 7:00 p.m.

Item 2 – Pledge of Allegiance

Item 3 – Action on Executive Session Item

MOTION: Mr. Vouros moved that the Board of Education support, as recommended by the Superintendent, Amy Oberlander’s request pertaining to Article 31.2 of the teacher contract. Mr. Cruson seconded. Motion passes unanimously.

Ms. Zukowski noted that two Board members were unable to attend the meeting.

Item 4 – Celebration of Excellence

Mr. Melillo spoke about the Profiles in Professionalism awards which are given to teachers and other staff members who have been recognized by their colleges in being excellent in what they do. The following received the award: Claire DeSisto, grade 3 teacher at Middle Gate School, Kristin English, English teacher at Newtown High School, Jessica Fonovic, math specialist at Reed Intermediate School, Leigh Anne Hildebrandt, art teacher at Newtown Middle School, Elizabeth Krupa, Technology Database Administrator, Dana Manning, Newtown High School assistant principal, Lisa Marlin, clerk in Sandy Hook School, Julie Mauri, library media clerk in Newtown Middle School, Lisa Pavia, paraeducator at Hawley School, Fernando Pereira, School Resource Officer, Newtown Middle School, Lina Silveira, Reading and Language Arts Consultant at Middle Gate School, and Jennifer Soloman, special education paraeducator at Head O’Meadow School. A reception followed.

Item 5 – Consent Agenda

MOTION: Mr. Vouros moved that the Board of Education approve the consent agenda which includes the Newtown High School Spain Student Exchange Program. Mr. Cruson seconded. Motion passes unanimously.

Item 6 – Public Participation

Item 7 – Reports

Chair Report: Ms. Zukowski reported that Michelle Hiscavich shared that the district won the Best Communities for Music Education Award from the NAMM Foundation. The Capstone projects were being presented this week at the high school.

Superintendent's Report: Mr. Melillo said there was an uptick in COVID cases in the elementary schools. May 15 he attended the CAPSS Superintendent/Student Award Ceremony at the Amber Room in Danbury. The students who received the awards are Clare Csaszar and Talmage Bacon from Newtown Middle School and Kate Shirk and Stephen Cook from Newtown High School. We completed negotiating the education personnel and custodian and maintenance contracts and will bring them to the Board for approval.

#### Committee Reports

Mr. Cruson said the Policy Committee met May 3 and continue to discuss the administering of medicine policy and employee safety and student health services. They are almost finished with the 4000 series employee policies.

Mrs. Plante said the CFF Committee met May 18 and had an update on the Hawley project. The new director of facilities will begin June 5. The also discussed proposed budget adjustments.

Mr. Cruson went to the Middle School production of *Newsies* which was well attended. He also attended the 4<sup>th</sup> grade chorus/recorder concert at Head O'Meadow School last night. Mr. Vouros went to the middle school band and chorus concert which was spectacular.

#### Students Report:

Ms. Kunzweiler reported that AP exams were finished. The Chess Team finished second in the Danbury Scholastic Chess League tournament. Various field trips have also been taken.

Mr. Godino stated that the junior and senior proms were held this month. Girls tennis finished first place in SWC's and the girls and boys track team took first place. Senior Spirit Week began this week. The Class of 2023 Demi-Decile students and CAFE award winners were announced. Regarding the banning of books from the libraries, they asked those members who voted in favor of the ban to reconsider their decision.

#### Financial Report:

MOTION: Mr. Vouros moved that the Board of Education approve the financial report and transfers for the month ending April 30, 2023. Mr. Cruson seconded. Motion passes unanimously.

#### Item 8 – Old Business

#### Item 9 – New Business

#### Chartwells Contract Renewal:

MOTION: Mr. Vouros moved that the Board of Education approve a one-year renewal "Amendment No.1" to Compass Groups USA, Inc., by and through its Chartwells Division initial agreement for food services dated August 23, 2022 with an effective date of July 1, 2023 through June 30, 2024. The terms and conditions in the original agreement as amended will apply. Mrs. Plante seconded.

Mrs. Vadas said this was a five-year contract with four renewal periods. The only amendment we have is that they can adjust their administration fee and they will be going up. Motion passes unanimously.

#### Continuation of School Activities Fund Accounts:

MOTION: Mr. Vouros moved that the Board of Education approve the continuation of the school activities fund accounts. Mrs. Plante seconded.

Mrs. Vadas suggested bringing these accounts to the Board in August when they are closed. Mr. Zukowski would bring it to the CFF Committee prior to August. Motion passes unanimously.

First Read of Policy 4-301 Appointment of Duties of School Medical Advisor to be rescinded: Mr. Cruson stated that Suzanne D'Eramo, Anne Dalton and Karen Powell didn't feel the need for this policy and would adopt the new one.

First Read of Policy 4215.1 Evaluation of School Nurses: Mr. Cruson stated the old policy is 4-302. Cabe said the existing policy was fine but a change was made to bring it in alignment with the current practice.

Minutes of May 2, 2023:

MOTION: Mr. Vouros moved that the Board of Education approve the minutes of May 2, 2023. Mrs. Plante seconded.

MOTION: Mrs. Plante moved to amend the motion to append the Special Review Committee Report to the minutes. Mr. Cruson seconded. Motion passes unanimously. Main motion passes unanimously.

#### Item 10 – Public Participation

Evelyn Weinberger, 17 Sweet Briar Lane, spoke about book challenges.

Therese O'Sullivan spoke about the last meeting and book challenges.

MOTION: Mr. Vouros moved to adjourn. Mr. Cruson seconded. Motion passes unanimously.

#### Item 11 – Adjournment

The meeting adjourned at 8:33 p.m.

Respectfully submitted:

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Deborra Zukowski  
Chair