Matter and Its Interactions:
Design a New School Uniform

Description: Use elements, compounds, and materials to create a new school uniform/outfit that aligns with the given requirements.

Project purpose: Give students the opportunity to apply their study of matter by researching, reasoning, and designing.

CCSS.ELA-LITERACY.W.5.2.D
Use precise language and domain-specific vocabulary to inform about or explain the topic.
CCSS.ELA-LITERACY.RI.5.7
Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
CCSS.ELA-LITERACY.RI.5.9
Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
CCSS.ELA-LITERACY.RI.5.10
By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.
CCSS.ELA-LITERACY.SL.5.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.5.1.A
Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.5.5
Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
CCSS.ELA-LITERACY.SL.5.6
Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation. (See grade 5 Language standards 1 and 3 here for specific expectations.)
5-PS1-3 Make observations and measurements to identify materials based on their properties.
5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Adjust the timing of these activities to fit your schedule. The days are suggestions.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
*Intro the periodic table *Define elements, and compounds *Intro project *Form groups/ partnerships/ independent work decisions *Initial drafting	*Research and blueprint day	*Research and blueprint continued *Begin diagram sketching, coloring, and labeling	*Diagram sketching, coloring, and labeling *Begin choice explanations	*Continue choice explanations	*Prep for Uniform Gallery Walk: Students should be prepared to display their uniform pieces with explanations. They should also be prepared to answer questions (suggestions below).	*Uniform Gallery Walk: (This is a great time to discuss museum behavior.) 1. Split your class in half or invite other classes. 2. Allow students to present and/or walk through the gallery.

Question Suggestions:

-What was your most useful element, compound, or material?
-What is your bonus feature and how does it work?
-In your opinion, which requirement was the most difficult to follow?
-Do you have a favorite garment you designed? Why?
-What was your choice element or compound? What was it used for?

Teacher Prep:

1. Copy the first handout for students to use when discussing elements and compounds. This is also what they will need to see when the project is being introduced. (materials offered, expectations, space for brainstorming) *I recommend displaying a periodic table when discussing the project's beginnings.
2. Students will also need a copy of the Research Notes for conducting research on the provided elements, compounds, and materials.
3. I used the blank sketch forms in a larger format. It's a good idea to enlarge these on 11x14 or 11x17 paper for the students. Each group will need a copy of each for sketching out and diagramming their designs. (Choice garments, eyewear, and bonus features were drawn by the students on large blank paper.)
4. Each student will need a copy of the Choices, Support, and Reasoning pack. This is where students explain their choices. *What elements and compounds did you use for each garment and, most importantly, why?*
5. After student presentations, students will complete the Uniform Gallery Reflection. Each student will need a copy.

Name: _____

Design a New School Uniform

Required Garments/Accessories:

Shirt	*Water bottle/mechanism*
Shorts/Skirt	*Eye protectant*
Socks	*Choice Garment*
Shoes	*Choice Accessory*

Materials Provided:

Neoprene	Steel
Polyester Fleece	Cotton
Textilene	Oxygen
Nylon taffeta	Praseodymium
Silver	Styrofoam
Polyurethane	Polycarbonate
Copper	Plastic
Microfiber	Rubber
Lead	Nickel
Silicon	Tin
Choice 1	Choice 2

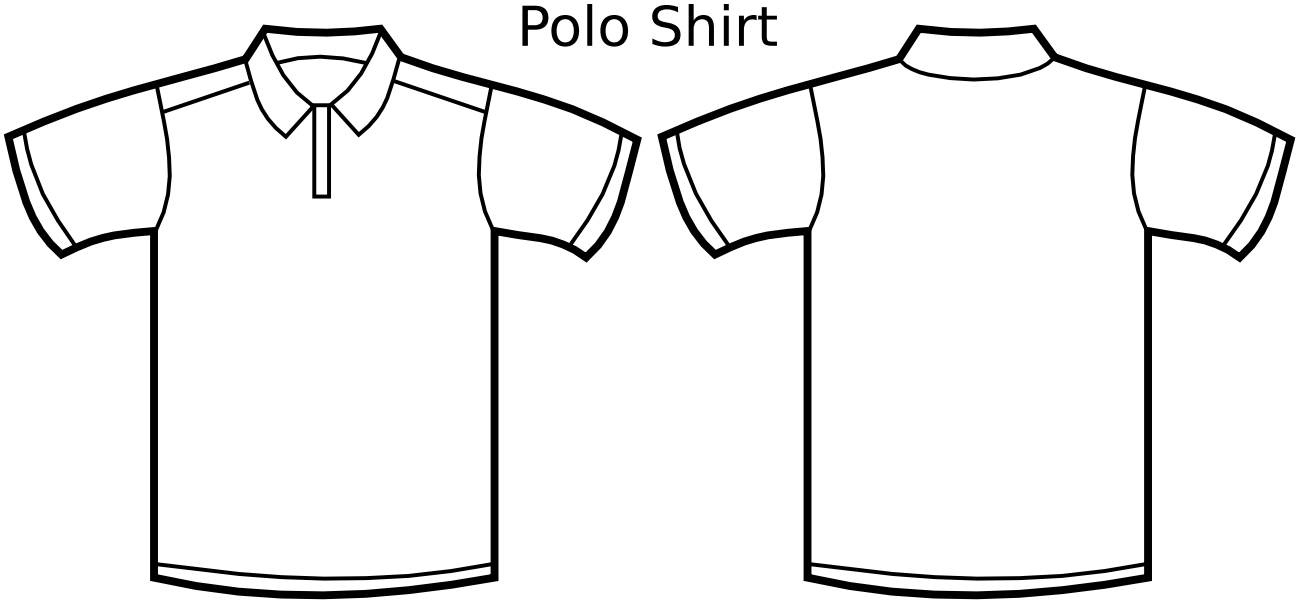
Uniform Musts:

-water repellant
-include a breathing mechanism in case of fire
-place to store drinking water
-ability to charge iPad
-include at least 1 bonus feature

Research Notes

Material	Description	Possible Uses

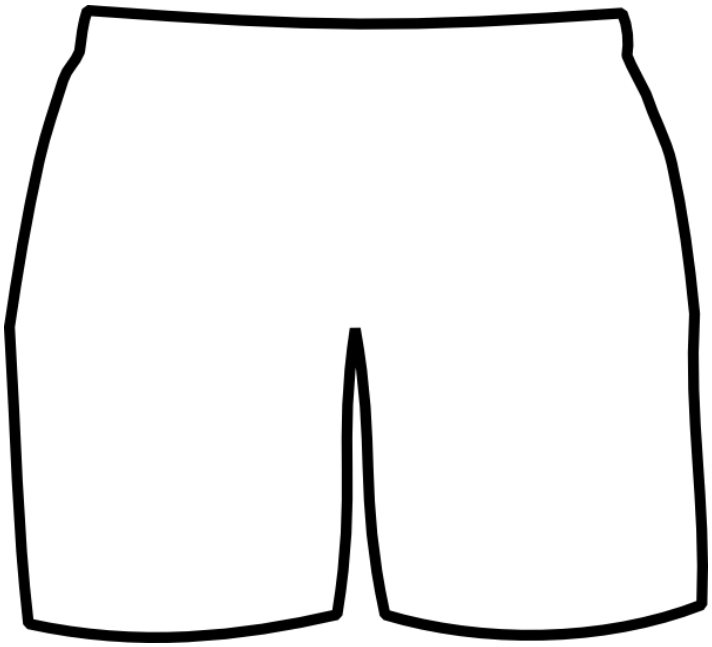
Polo Shirt



Front

Back

Image Credit: Polo Shirt Template Clip Art from Vector.me (by nicubunu)



https://flyclipart.com/black-shorts-cliparts-shorts-clipart-302007

https://www.kindpng.com/imgv/iJhiRx_short-skirts-black-and-white-clipart-clothes-to/

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http://clipart-library.com/clipart/piqreko5T.htm

https://www.mycutegraphics.com/graphics/sock/black-white-crew-sock.html

Name: _____ #: _____

Elements, Compounds, and Materials: Choices and Support

Garment/Accessory	Element/Compound/Material	How and for what purpose is it being used?
skirt/shorts		

Garment/Accessory	Element/Compound/Material	How and for what purpose is it being used?
socks and shoes		

Garment/Accessory	Element/Compound/Material	How and for what purpose is it being used?
eyewear		

Garment/Accessory	Element/Compound/Material	How and for what purpose is it being used?
choice garment and choice accessory		

Garment/Accessory	Element/Compound/Material	How and for what purpose is it being used?
shirt		

Name: _____ Date: _____ #: _____

Uniform Gallery Reflection

1. Which uniform was your favorite? Why?

_____

_____

_____

2. In your opinion, which group's bonus feature was the most creative? Explain.

_____

_____

_____

3. We used many elements and compounds during this project. What is the difference between the two?

_____

_____

_____

4. Which element, compound, or material did you find most useful for your uniform? Why?

_____

_____

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