

Unit Title: Mimicking Animal Adaptations - Part 1 (Staying Warm) and Part 2 (Moving in the Snow)

Grade Level: 1

Subject Area: Science/Engineering

Duration/Length/Number of class periods: 15 class periods, approx. 30-45 minutes in length
(7 class periods for Part 1, 7-8 class periods for Part 2)

Description:

In this unit, students discover adaptations animals have to help them survive in their habitats, specifically, the tundra. They experiment and test various materials for their insulation and transportation properties. They use this knowledge to engineer two separate solutions to help a fictional character:

1. stay warm
2. move in the snow.

Finally, students reflect on the process, knowledge gained, and final product.

Established Goals (National, State, Local):

Science (2019 standards):

1L.3.2.2.2 Plan and design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* (P: 6, CC: 6, CI: LS1, ETS2)

Language Arts:

1.2.5.5 Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.

1.8.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.

1.8.5.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

1.8.8.8 With prompting and support, create and share an individual or shared multimedia work for a specific purpose (e.g., to share lived or imagined experiences, to present information, to entertain, or as artistic expression.)

What Enduring Understandings are desired?

Animals have unique adaptations that help them survive in their habitats.

Humans can use their knowledge of the natural world to help them develop solutions to human problems.

What Essential Questions will be considered?

What adaptations do animals have to help them survive in their environments?

How can humans mimic animal adaptations to survive?

Students will know/be able to:

Students will understand that animals have special adaptations to help them survive in their habitats.
 Students will be able to use this knowledge to engineer solutions for human survival in difficult habitats.
 Students will be able to reflect on their product and its effectiveness.

Description	Formative	Summative	Introductory Activity	Learning Activity	Student Technology Used	Teacher Technology Used	ISTE Standards
PART ONE- STAYING WARM Day 1: Read-Aloud: <i>What do you do with a Tail like This?</i> by Robin Page and Steve Jenkins Discuss how animals have special adaptations to help them survive Hook- Client Letter from Mr. Potato & Chatterpix video of talking potato - I'm moving to the tundra and I'm scared! I've never seen snow before! - How do animals do it? - First Mission - keep me warm, make me some special shoes to move through the snow - I've sent books to your teacher and some websites that may help. - I'll send more details later once I know which materials I have on hand. Introduce unit road map (a visual organizer for students to see when research, experiment, and engineering days will be) Assign groups Create group norms - each group creates a poster Explore books!			X			Chatterpix	7c
Days 2-3: Begin research and observations of animals from the tundra - how do they survive? - Students will freely explore printed texts AND - E-books: Unite for Literacy, Epic, Pebble Go Add sticky notes to class research board as you discover information As a class, read through the notes and collectively organize them by commonalities - which of these ideas could help our client?	X			X	Unite for Literacy, PebbleGo, Epic		3a, c, d
Day 4: Client Letter #2 - - introduce constraints for the first project, - must be able to be in the snow for 15 minutes and only lose a certain number of degrees of "body heat" - introduce materials available	X			X	Seesaw		5b 7c

○ consider assigning each material with a monetary value and restrict the “funds” available Review class notes on animal warmth Introduce concept of insulation - keeping hot hot and cold cold ● Possibly a teacher demonstration with ice cubes, hair dryer, and winter gloves Review group norms Groups have free exploration with materials - ● Record observations in a data table on Seesaw ○ How well does each material insulate? ○ How easy is each material to work with? ○ What does it mean to “insulate”?							
Day 5: Review group norms Discuss cost of materials and review constraints from client letter Groups work together to draw 3 potential designs Select the best - upload to seesaw and record thoughts ● Why did you choose the materials you chose? ● What made this design the best of the three your group made?	X			X	Seesaw		4a, b 6c 7c
Day 6: Creation & testing day! Create your design Each group gets one baked potato (still very warm, all at the same temp.) Measure and record temp Cover it in your design & put it in the snowbank for 15 minutes Immediately remove from snowbank, measure and record temp Reflection on Seesaw - what worked, what didn't, changes to make	X			X	Seesaw		4a, b, c, d 7c
Day 7: Re-design, improve, and re-test! Each group has the opportunity to make changes to their design and re-test it Each group will create a Flipgrid video for the client to demonstrate their product, discuss why it works, and explain which animals' adaptations were their inspiration		X		X	Flipgrid		4a, b, c, d 6d 7c
PART TWO - MOVING IN THE SNOW (May take place immediately following part one, or at a later date) Day 1: Client Letter #3: ● Thank you for the excellent designs! ● My biggest challenge now is getting to the store during a snowstorm! ● I've noticed some animals can get around no matter how deep the snow is - how do they do it? ● Constraints - cost, materials, specifications, etc. Read-Aloud: <i>Who Has These Feet?</i> by Laura Hulbert			X	X			3a, c, d

Discuss: which feet work best in the snow? What do they have in common?							
Day 2: Review research from class poster in part 1 Decide if additional research is necessary – PebbleGo, Epic, books, etc.				X	PebbleGo, Epic		
Day 3: (Collaborate with P.E. teacher) Groups have outdoor exploration with various walking tools- record data on Seesaw - Stilts - Clompers - Skiis - Snowshoes Discuss: Which worked the best for walking in the snow? Why? How is that similar to what we've noticed about animal feet?	X			X	Seesaw		
Days 4-5: Review group norms Discuss cost of materials and review constraints from client letter Groups work together to draw 3 potential designs Select the best - upload to seesaw and record thoughts - What inspired your design? - What made this design the best of the three your group made?	X			X	Seesaw		4a, b, c, d 6c 7c
Day 6: Creation & testing day! Create your "shoes" Each group gets one raw potato (temp doesn't matter, but weight should be very similar, cut potatoes if needed) Attach your shoes Gently set it on top of a snowbank Measure how far it sunk into the snow Group reflection on Seesaw - what worked, what didn't, changes to make	X			X	Seesaw		4a, b, c, d 7c
Day 7: Re-design, improve and re-test! Each group makes a Flipgrid video for the client to demonstrate their product, discuss why it works, and which animals were the inspiration		X		X	Flipgrid		4a, c, d 6d 7c
Day 8: Class discussion: : What were the biggest challenges & takeaways from this project? Client Letter #4 OR another Chatterpix video thanking students for their work Read Aloud: <i>What if you had Animal Teeth?</i> by Sandra Markle Class Discussion: - What other strategies could we take away from animal adaptations? - Why is it important to be observant of the natural world?		X					

Materials, tools and resources:

Access to student devices (iPads?)

- E-books, such as [PebbleGo](#), [Epic](#), or [Unite for Literacy](#)
- Seesaw
- Flipgrid

Read-Aloud Texts:

- *What if you had Animal Teeth?* by Sandra Markle
- *Who Has These Feet?* by Laura Hulbert
- *What do you do with a Tail like This?* by Robin Page and Steve Jenkins

Engineering Materials:

- Various inexpensive materials, such as pipe cleaners, bubble wrap, cardboard, felt, tape, etc

Testing & Research Materials:

- Potatoes - two per group
- Digital thermometer
- Ruler
- Various walking tools - snowshoes, stilts, clompers, skis - for students to explore
- Large poster and sticky notes to gather research

Digital Materials:

- Client Letters (4) - create to fit your students' needs and materials available
- Unit Road Map - create a visual map for students to see the order of events in the unit
- Pre-create data charts and response forms on Seesaw or similar digital platform

Unit Plan Author: Megan Dobberstein, Wilson Elementary, Owatonna Public Schools, mdobberstein@isd761.org

Additional credit given to: Bill McClintock, BestPrep