TWEAK THE BEAK

Can food effect our shape?

Learning Targets

- ✓I can show how an animal might adapt to its environment.

- ✓I can design and build a beak for a specific food source.

- ✓I can express that a change in an environment can cause a variation in the shape of birds' beaks.

- ✓I can show that one adaptation is not completely better than another.

- ✓I can work positively and productively in a group setting.

One-sheet lesson overview

Step1: Engage

Give students chopsticks (their beak) and birdseed they must collect on to a personal plate/bowl (their nest).
***Natural Disaster!** All birdseed is gone!*
Brainstorm new food sources.

Step2: Explore

Students design new beaks for their new food sources using recycled materials. Use the "Tweak the Beak worksheet".

Fruit	Small birds
	
Flower Nectar	**Fish**	**Plastic bugs in soil**
		

Step3: Explain

Build, test, and present.

Step4: Elaborate

Discussion: ***"What would, adapting to different food sources, look like for other animals? What other changes in a creature's environment could cause a change in its shape?"***

Step5: Evaluate

Fill out "Adaptations Worksheet" and "Self-assessment".

Name: Roxi Nunan
Lesson Title: Tweak the beak

Primary Subject Area and Grade Level:	
Subject Area: Science **Grade:** 3rd	
Lesson Duration: 1 hour and 45 minutes	
Adaptations:	
ELL: Keywords and concepts will be translated. Expression of information can be through drawings. **LD:** The physical engagement of engineering, learning through discussion, and expression of information through drawing in addition to written will support these children's needs. **BD:** Emphasis in this lesson is put on positive participation. The self-assessment at the end of the lesson (suggested use at the end of every lesson) will give these students a way to express their needs. **SPED:** Accommodations according to students' IEPs. Students that are already familiar with the concepts can be grouped with these students. Paraeducator one-on-one time.	
Learning Targets:	
I can show how an animal might adapt to its environment. I can design and build a beak for a specific food source. I can express that a change in an environment can cause a variation in the shape of birds' beaks. I can show that one adaptation is not completely better than another. I can work positively and productively in a group setting.	
Standards:	
NGSS 3-LS3-2: **Use evidence to support the explanation that traits can be influenced by the environment.**	Show understanding that birds and other animals adapt to their environment.
Science & Engineering Practices: **Constructing Explanations and Designing Solutions** Disciplinary Core Ideas: **Heredity: Inheritance and Variation of traits** Crosscutting Concepts: **Cause and effect**	Students will examine and **design** adaptations. They will examine the **variation** in birds. Students will discuss how a change in the environment can **cause** a change in animals, **affecting** their shape.
Students will respond to diversity by building empathy, respect, understanding, and connection.	Students will examine that one beak is not better than another just as one person is not better than another.
Overview:	
Students will examine the variations in bird beak shapes by examining the different food sources they eat. Students will design and construct beaks to eat different food types. Students will share their bird beak adaptation with the class, showing why they designed it that way. Students will try to eat a different food source with their specifically adapted beaks. Students will discuss what adaptations might look like in other animals, including humans. Students will pick a random animal and draw two adapted versions of it. Lastly, they will evaluate their learning for the day.	

Technologies and Other Materials/Resources:

Worksheets and rubrics: (attached at the end of the lesson plan)	**Beak building supplies:**	**"Food source" supplies:**
Grading Rubric Self-assessment Tweak the Beak Adaptations Note: A lot of tape	Chopsticks (1 set per student) rulers plastic cups plastic cutlery Socks straws cardboard Tape Rubberbands Any other recyclable materials...	Birdseed (enough for whole class) graduated cylinder/tall cup puff ball string plastic bugs bowl of sand/soil sponge bucket floral beads(water absorbent pearls)

Grouping Strategy:

Students should be grouped in a way that mixes skill levels. Students with lower skills in Science or English should be mixed with students that are effective communicators and are familiar with the subject so they can support their peers.

Assessment strategies:

Formative:

- Type of assessment: Group discussion, teacher observation, teamwork, and "Design" sheet.
- What is being assessed? The design process, group participation, knowledge of adaptations, respect, and understanding of cause and effect.

Summative:

- Type of assessment: Finished beak design, and "Adaptations" worksheet.
- What is being assessed? Design principles, adaptations, and understanding of cause and effect.

Student's voice:

- Type of Assessment: Self-assessment (Exit ticket)
- What is being assessed? Content knowledge, self-monitoring, mood, productivity, and group work.

Academic Vocabulary:

Cause and effect environment variation	engineering design creature

Lesson	
Teacher instruction	Student behaviors
ENGAGE	
• Class discussion, 5 minutes: Write the question on the board o *"Does your food and environment affect your body's shape?"* Lead a class discussion on the topic. Steer it away from obesity and malnourishment.	Students will raise hands to participate in class discussions. Students will participate in the activity in a positive and on-task manner.

• Activity, 10 minutes: Give every student a pair of chopsticks *"You are a bird, this is your beak"* Give students birdseed they must collect on to a personal plate (their nest). o Declare in a loud, overdramatic voice, *"Oh no! Natural disaster! All birdseed is gone!"* Ask students *"What else could you, as a bird, eat? Can you eat that with a chopstick beak?"* Let the students discuss this for a while and write possible food sources on the board. ex:(flower nectar, smaller birds, bugs, fish, fruit) o Divide the class up by food categories.	
EXPLORE	
• State learning targets, 5 minutes: Post the learning targets on the board and have the class read them aloud together. o *"I can show how an animal might adapt to its environment.* *I can design and build a beak for a specific food source.* *I can express that a change in an environment can cause a variation in the shape of birds' beaks.* *I can show that one adaptation is not completely better than another.* *I can work positively and productively in a group setting."* • Activity, 30 minutes: Give groups a "design sheet" for them to work on while the teacher puts out supplies. o Put out beak supplies on the main table. o Distribute "food" supplies to the corresponding tables: nectar=graduated cylinder with water or a tall cup of water, smaller birds=a puff ball hanging from the ceiling, bugs=plastic bugs in a bowl of sand, fish=a sponge in a bucket, fruit=floral beads (gelatin beads) on a plate. o Students will assign jobs and draw what the beak would look like and how else the bird's body could change to get its food better. o Once the teacher has finished putting supplies out, students can start constructing their beaks. o The teacher should circulate from group to group, looking at designs, and asking questions.	Students will listen to and read aloud together the learning targets. This will make their learning and attention focused on the learning targets. Students will participate in the activity in a positive and on-task manner.
EXPLAIN	
• Present, 15 minutes: Once all teams are done constructing their beaks they will take turns presenting them to the class. Students will explain their design and adaptations. Then they will demonstrate the beak "eating the food". • Activity, 5 minutes: Groups will walk around the room trying to "eat" other groups' "food" Does it work?	Groups will present their beak designs using clear communication strategies. Students will sit and listen as their classmates present. Students will participate in the activity in a positive and on-task manner.
ELABORATE	

• Class discussion, 20 minutes: Ask these guiding questions, giving students time between them to respond. o *"What would, adapting to different food sources, look like for other animals? What other changes in a creature's environment could cause a change in its shape?"* o *"Is one adaptation better than others? Or did they just adapt to different things?"* o *"Do we, as birds, have the right to judge other birds?" "What about as humans?"* o Write ideas on the board.	Students will raise hands to participate in class discussions. Students will learn from each other through discussion, forming their own conclusions.
EVALUATE	
• Independent work, 15 minutes: o Hand out the "Adaptations" worksheet. Pick any type of creature (bird, fish, mammal, or plant. but not human) and draw a picture and/or write a description of it. Pick a change in its environment (food, temperature, or predator). Draw and/or write how that creature might adapt to that change. o After 10 minutes hand out the "self-assessment" sheet.	Students will fill out their worksheets while free to discuss them with each other.

Worksheets and assessments below:

Grading rubric for the finished beak, class participation, and adaptations worksheet.			
Learning Target	Success Criteria 5pts	3pts	0pts
Show understanding that birds and other animals adapt to their environment.	I can show how an animal might adapt to its environment.		I cannot show how an animal might adapt to its environment.
Students will examine and design adaptations.	I can design and build a beak for a specific food source.	I can work with a group to build or design a beak but not both	I cannot design or build a beak for a specific food source.
Students will discuss how a change in the environment can cause a change in animals, affecting their shape. They will examine the variation in birds.	I can express that a change in an environment can cause a variation in the shape of birds' beaks.		I can't express that a change in an environment can cause a variation in the shape of birds' beaks.
Students will examine that one beak is not better than another just as one person is not better than another.	I can show that one adaptation is not completely better than another.	I can show that each adaptation has its strengths.	I cannot discuss this topic respectfully.
Students will participate in class discussions and group work.	I can work positively and productively in a group setting.	I can be positive or productive in a group setting but not both.	I cannot be positive or productive in a group setting or class discussions.

TWEAK THE BEAK

Jobs for group members: ->	***Suppliers:***
	Designers:
Food source:	***Builders:***

Plan #1:

Test results:

Plan #2:

Test results:

More room for tests on the other side -------->

Adaptations

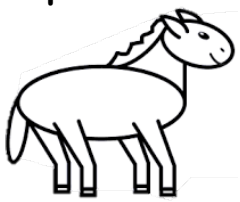
Name:

Creature:

Change in the environment:

Original Creature:

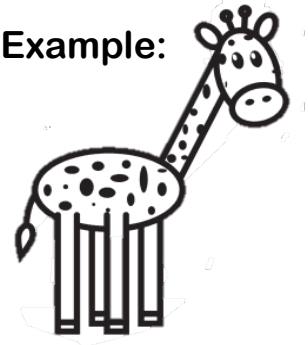
Example:



How it changes:

Adapted creature:

Example:



Why:

SELF ASSESSMENT

Name_____ Date_____

I am frustrated	I'm confused	I feel confident	I could teach this
			

How I feel about cause and effect.	
How I feel about animal adaptations.	
How I feel about design and engineering.	
How I feel about our class discussions.	
How I feel about the world today.	

Group mates: _____

_____

_____

How I feel about my groupmates' work.	
How I feel about my group's discussion.	
How I feel about my group work today.	
How I feel about the independent work I did today.	

Other notes or questions: