

Teachers, parents, guardians and other adult supervisors: Please use this worksheet to guide students as you explore our exhibit halls together.

The questions below help connect the exhibit content with the Grade 2 curriculum. Students will explore these concepts in their classrooms throughout the school year.

We have provided curriculum-connected answers to some questions, while answers to others will be open-ended based on each student's experience with the exhibit. These questions are intended to promote discussion among the group.

Have fun!

LEVEL

4 KidSpark

Rhoads Sculpture

Topic: Simple Machines and Movement

- Q.** Which simple machines are used in this exhibit?
- A.** Inclined planes (ramps), levers, pulleys and gears.

Prompt:

There are six different ball entrance points on this sculpture. Find and count the number of levers, pulleys and inclined planes at each entrance point from the time the ball enters until it returns.



Located near the KidSpark entrance.

Build Your Own Coaster

Topic: Simple Machines and Movement

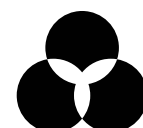
Prompt:

Build a roller coaster track and test it with a ball. Watch and remember how far the ball travels when you start at the end. Then, try starting it at different points on the track. Try to re-design and re-build the track so that the ball will travel even farther.



Open-ended Questions:

- Q.** Where do you have to place the ball to make it go the farthest? Why does it travel farther?
- Q.** Where does the ball move the fastest?
- Q.** If you start two balls at either end of the track, where do you think they will meet? Try it and see. Can you make them meet in the middle of the track?



Hot Air Balloon

Topic: Air and Water in the Environment



- Q.** Push and hold the red button. What happens in the basket?
- A.** Flames are lit in the basket.

- Q.** What happens to the balloon? Why?
- A.** The balloon puffs out as it fills with hot air. Then, the hot air rises and takes the balloon with it.

- Q.** Count out loud to measure how many seconds the balloon stays in the air. Why does it come back down?
- A.** The hot air in the balloon slowly cools until it is the same temperature as the air around it. When the hot air is gone, gravity pulls the balloon back to Earth.

Water Table

Topic: Air and Water in the Environment

Open-ended Questions:

- Q.** How can you move the water in the water table?
- Q.** What causes water to move in real life?
- Q.** Can you make something in the water table move without touching it?
- Q.** Can you channel the water to make a river?



Note:

Bodies of water such as rivers, creeks and lakes flow due to gravity. Water flows from higher points to lower points.

Gear Wall

Topic: Simple Machines and Movement

Prompt:

A gear train is an interconnected series of gears. If you spin one gear, the other gears will all move as well. Build a gear train that connects the gear at the bottom of the wall to the gear at the top of the wall.



- Q.** Spin the gear with the handle. Which direction does this make the other gear spin?
 - A.** The other gear spins in the opposite direction.

- Q.** Try connecting four or five gears, then spinning them. Which direction does each gear turn? Is there a pattern?
 - A.** Each gear will turn the opposite direction of the one it is in contact with.

- Q.** When the gears are all turning, which gears move more quickly—the larger gears or the smaller ones?
 - A.** The smaller gears spin more quickly than the larger ones.

- Q.** Find a gear that has 18 teeth (bumps) and one that has 9 teeth. Spin the gear with 18 teeth around one time. Make sure to stop in the exact same place you started. How many times did the gear with 9 teeth turn?
 - A.** The gear with 9 teeth turns two times.

- Q.** Imagine you have a gear with 27 teeth connected to a gear with 9 teeth. If you spun the larger gear once, how many times would the smaller gear turn?
 - A.** The gear with 9 teeth would turn three times.

LEVEL

6 Forest Lane

Which Wood You Rather Lift?

Topic: Properties of Liquids and Solids

Prompt:

Look at (but don't touch!) the two types of wood in the exhibit and predict which wood is heavier. Then, try lifting the two pieces of wood. Was your prediction correct?



- Q.** Why do the types of wood have different weights?
- A.** Balsa has thin-walled, loosely packed fibres that stay hollow. Ebony has thick-walled, densely packed fibres that fill with sap.

- Q.** What types of products could you make out of each type of wood? Explain your reasons.
- A.** Answers will vary. An example of a use for ebony is piano keys, because they have to withstand being pressed all day. An example of a use for balsa is model airplanes, because they need to be light.

- Q.** Why is it important to consider a material's properties when choosing it for a product?
- A.** Answers will vary. Understanding a material's properties helps you understand its strengths and weaknesses for certain uses. For example, balsa is lightweight and malleable. It can also be damaged more easily than a harder type of wood.

LEVEL

6

Weston Family Innovation Centre

Turn the Tubes

Topic: Properties of Liquids and Solids

Prompt:

Look inside the tubes and think about the different materials inside.

Open-ended Questions:

- Q. Turn over the tubes. Do the different materials move differently? Can you describe how they flow?
- Q. Can you think of other liquids that have similar properties?

Note:

Students may comment on how fast the liquids flow or how viscous (thick) they are. They may also notice the solid pieces mixed in with some of the liquids.



LEVEL

6

The Bruce Poon Tip Living Earth Hall

Fin Whale Skeleton

Topic: Growth and Changes in Animals

Open-ended Questions:

- Q. Compare the whale's skeleton to your own skeleton. What similar features do you share? What differences are there?
- Q. Can you think of other characteristics of a whale that are similar to a human's?
- Q. Have a look at the whale baleen on display on the floor. A baleen is a filter some types of whales have in their mouths to trap food. Compare the baleen to your teeth. What is different about how each is used?



Can't find it? Look up!

Note:

A whale with a baleen will open its mouth to take in large volumes of water, then close its mouth and force the water out through the baleen. The baleen traps fish and other prey for the whale to eat.



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Skulls

Topic: Growth and Changes in Animals



- Q.** Look at the timber wolf skull and describe the teeth. Are they sharp or flat?
- A.** The skull has sharp, pointy teeth.
- Q.** Do you think this animal would eat meat or plants? How do you know?
- A.** The wolf would eat meat. Sharp, pointy teeth are useful for eating meat. Flat teeth are useful for eating plants.
- Q.** Animals that only eat meat are called carnivores. What are some other examples of carnivores?
- A.** Some examples of carnivores include lions, tigers and polar bears.
- Q.** Look at the teeth in the deer and chimpanzee skulls. What shape are they? What type of diets do you think these animals would eat?
- A.** The deer has flat teeth. Deer are herbivores, which means they eat only plants. The chimpanzee has some flat teeth and some pointy teeth. Chimpanzees are omnivores, which means they eat both plants and meat.
- Q.** Look at your own teeth or a friend's. Which animal's teeth are most like human teeth? Hint: Think about human diets.
- A.** Human teeth are similar to chimpanzee teeth. Like chimpanzees, humans are omnivores. We have different shaped teeth for eating different types of food.

Open-ended Question:

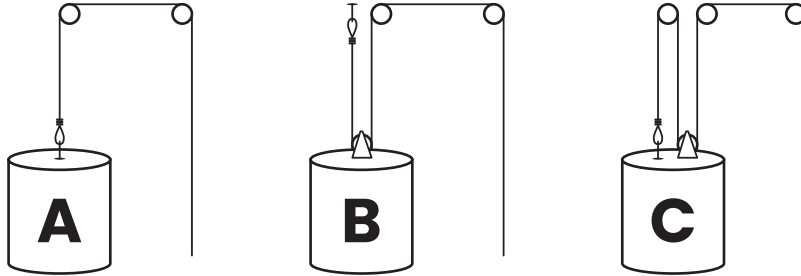
- Q.** What other activities, other than eating, might animals use their teeth and jaws for?

LEVEL

6 Science Arcade

Pulleys

Topic: Simple Machines and Movement



Q. Which load is the easiest to lift?

A. Load C.

Q. Which load takes the most amount of force to lift?

A. Load A.

Q. Count the number of pulleys supporting each 6 kg weight. Why does each one feel different?

A. Load C has four pulleys, while load A only has two. When there are more moveable pulleys, mechanical advantage increases and the amount of force needed to lift the load decreases. In other words, having more pulleys makes it easier to lift a load.

Q. Other than in our exhibits, where else at the Science Centre could you find pulleys? Hint: You might not be able to see all of them.

A. Answers will vary. Examples of other pulleys include the elevators and flag poles outside.