

## The Wheel Deal

*Explore how wheels help move objects and reduce friction.*

### Big Idea

Wheels move objects.

### Standards

<b>1.C</b> Use language to convey information and ideas.	<b>9.B</b> Demonstrate an understanding of location and ordinal position, using appropriate vocabulary.
<b>10</b> Begin to make predictions and collect data information.	<b>11.A</b> Develop beginning skills in the use of science and engineering practices, such as observing, asking questions, solving problems and drawing conclusions.
<b>12.C</b> Explore the physical properties of objects.	<b>12.D</b> Explore the concepts of force and motion.
<b>13</b> Understand important connections and understandings in science and engineering.	

### Materials

- Wagon, bicycle, scooter or stroller
- Other objects that have wheels, or are shaped like a wheel – such as toy cars, canned food, paint containers, spools, cups, crayons, rolls of tape, etc.
- Objects that do not roll – such as blocks that are cubes or cones, boxed food, books, paper clips, glue bottles, etc.

### Setup

Open space on the floor or on the ground outside

### Directions

1. Turn the [wagon or large object you are using] upside down, with its wheels up in the air.
2. Ask a child to sit on the [wagon, only if it is safe to do so].
3. Try to pull the [wagon].
4. Turn the [wagon] over so that the wheels touch the ground. Pull the [wagon]. Discuss how the wheel and axle works.
5. Introduce the idea of friction.
6. Try other objects.

7. Compare the objects that roll to the objects that do not roll. (Use an inclined plane if you'd like.)

*Investigation Questions:*

*Q. Why is the [wagon] difficult to pull? (the [wagon] is upside down)*

*Q. How can we make it easier to pull? (turn the [wagon] over)*

*Q. Who thinks it will be easier and who thinks it will be more difficult to pull? Why? (the [wagon] is upright on wheels)*

*Q. Is there more friction when you turn the wagon upside down, or on its side? Why?*

*Q. What happens when you try to push a can of soup that sitting upright? What happens if you turn it on its side? Why does it roll? Is it easier to move in this way?*

**Vocabulary**

**Friction:** the rubbing force of one object against another; this causes moving objects to slow down

**Wheel and axle:** device that allows heavy objects to be moved easily though rotating on an axle through its center