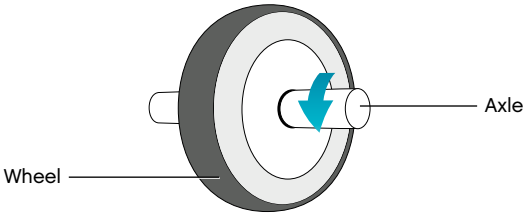
Name(s): **Date and subject:**

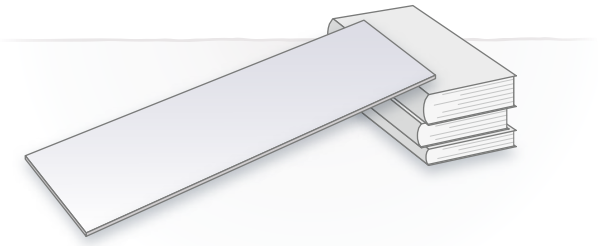
Principle Models: Wheels and Axles

Student Worksheet

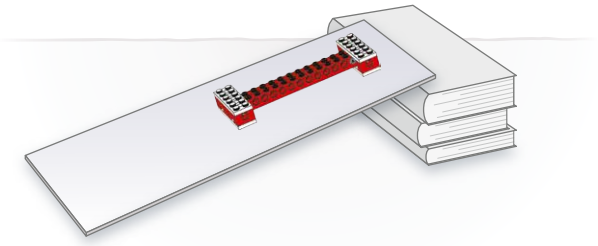
Things to talk about:
- What do you know about this simple machine?
- Where do we use this simple machine?
- Why do we use this simple machine?



Build a ramp to test the first two principle models B1, B2.
Books for height and a plank of wood or piece of stiff cardboard should be effective.
When your ramp is ready, then build and test the models, one at a time!



1. **Build B1** (Sliding model).
   Follow Building Instructions B, pages 4 to 6, steps 1 to 5.



2. **Try out the model and make observations.**
   Find friction. Mark with an arrow where you think there is friction when you let the model slide down the ramp.

   Measure how far the model travels.
   Write your answer here:

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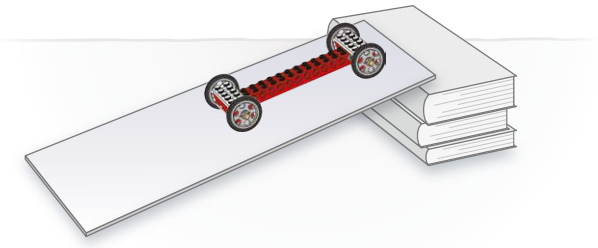
1. **Build B2** (Rolling model).
   Follow Building Instructions B page 8, step 1.



2. **Try out the model and make observations.**
   Friction is a force that slows down motion when two surfaces move against each other.

   Is this model affected by friction? YES / NO

YES ☐ NO ☐

   Measure how far the model travels.
   Write your answer here:

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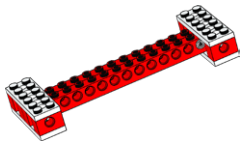
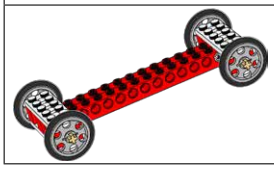
3. Compare model B1 to model B2.
How easy or difficult was it to make model B1 move compared to model B2?
Mark each model.

	Easy	Difficult
		
		

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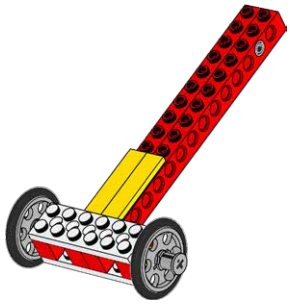
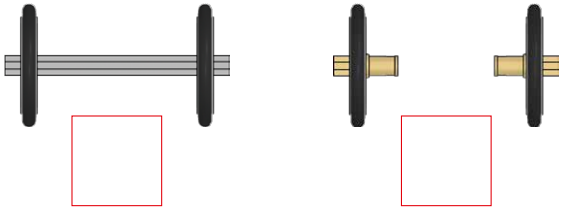
1. Build B3 (Single, fixed axle model).
Follow Building Instructions B, pages 10 to 14, steps 1 to 9.

This model must be tested on a flat surface.



2. Try out the model and make observations.
Mark which type of axle is used in the model.



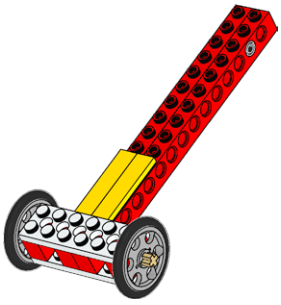
Test your model moving in a straight line.
Mark how easy or difficult it is to steer your model in a straight line.

	Easy	Difficult
		

Test your model turning a corner.
Mark how easy or difficult it is to steer your model round a corner.

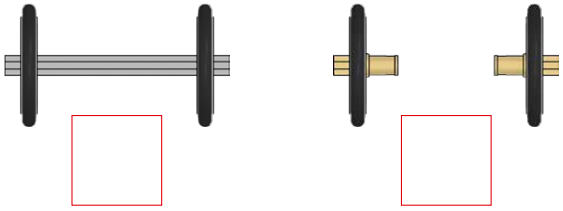
	Easy	Difficult
		

1. **Build B4** (Separate axles model).
   Follow Building Instructions B, pages 16 to 20, steps 1 to 7.



This model must be tested on a flat surface.

2. **Try out the model and make observations.**
   Mark which type of axle is used in the model.



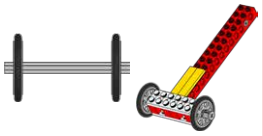
Test your model moving in a straight line.
Mark how easy or difficult it is to steer your model in a straight line.

	Easy	Difficult
→		

Test your model turning a corner.
Mark how easy or difficult it is to steer your model round a corner.

	Easy	Difficult
↘		

3. **Compare model B3 to model B4.**
   How easy or difficult was B3 to steer compared to B4?
   Mark your answer.

	Easy	Difficult
 B3 Single, fixed axle		
 B4 Separate axles		