SONOMA RACEWAY

Friedman's HOME IMPROVEMENT

OBJECTIVES

Your child will:

- Understand how an axle enables rotation
- Build content vocabulary (axle, low friction, wheel)
- Identify a problem and a solution
- Understand how a simple diagram can illustrate a complex idea
- Practice oral and written language skills
- Illustrate construction of an axle

You will need:

- As the Axle Turns sheet
- Engineer's Journal (see Lesson 1)

LESSON 4

AS THE AXLE TURNS

START YOUR ENGINES!

SAY: *Imagine you race outside to ride your new bike, but discover that a large branch has fallen from the oak tree in your yard and is stuck right through the spokes and hub! Do you think your wheels can turn anyway? Why not?* (A: The branch prevents the wheels from spinning!)

SAY: *What if the wheels were glued on to a car? Could the wheels spin then?*

EXPLAIN: *Wheels—and tires—can't move without being able to spin from the center. Where is the center on your bike wheel?* (A: The hub in the middle) *The "hub" is an "axle" for the wheel. Car wheels work the same way and need an axle to spin. But what is an axle? Today we will help Engineer Gerry figure out a solution to a problem he's having with wheels that won't spin.*

GO!

Give your child the "As the Axle Turns" Worksheet

SAY: *As you read, identify Gerry's problem and solution.*

Have your child copy the chart below in their Engineer's Journal.

PROMPT	ANSWERS
What is Gerry's **problem?**	
What is Gerry's **solution?**	

ANSWERS: What is Gerry's **problem?** *Wheels won't turn; he glued on wheels so they can't rotate or spin.* What is Gerry's **solution?** *Build an axle using a straw and skewer so the wheels can spin.*

DISCUSS: *What does the straw do?* (A: Provides a "casing" so the axle can rotate.) *What does the skewer do?* (A: Connects to the wheels so they can rotate.) *Are there other materials you could use to make an axle?*

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LESSON 4

AS THE AXLE TURNS

VICTORY LANE!

1. **Chat it UP!** Discuss why gluing wheels to the side of a toy car won't work. Describe a better option that will make the wheels spin. Explain exactly how it works using the words straw, skewer, wheels, axle and rotate.

2. **Imagin-eer!** In your Engineer's Journal, illustrate the construction of the axle for your car including a sketch of the car, wheels, straw and skewer. Label parts.

3. **Write On!** Write a letter to a friend or family member telling them what you learned today. Explain the axle problem and solution in detail. (Be sure to use the five parts of a friendly letter: date, greeting, body, closing and signature! Sample below.)

Today's Date

Greeting,

Body

Closing,
Signature

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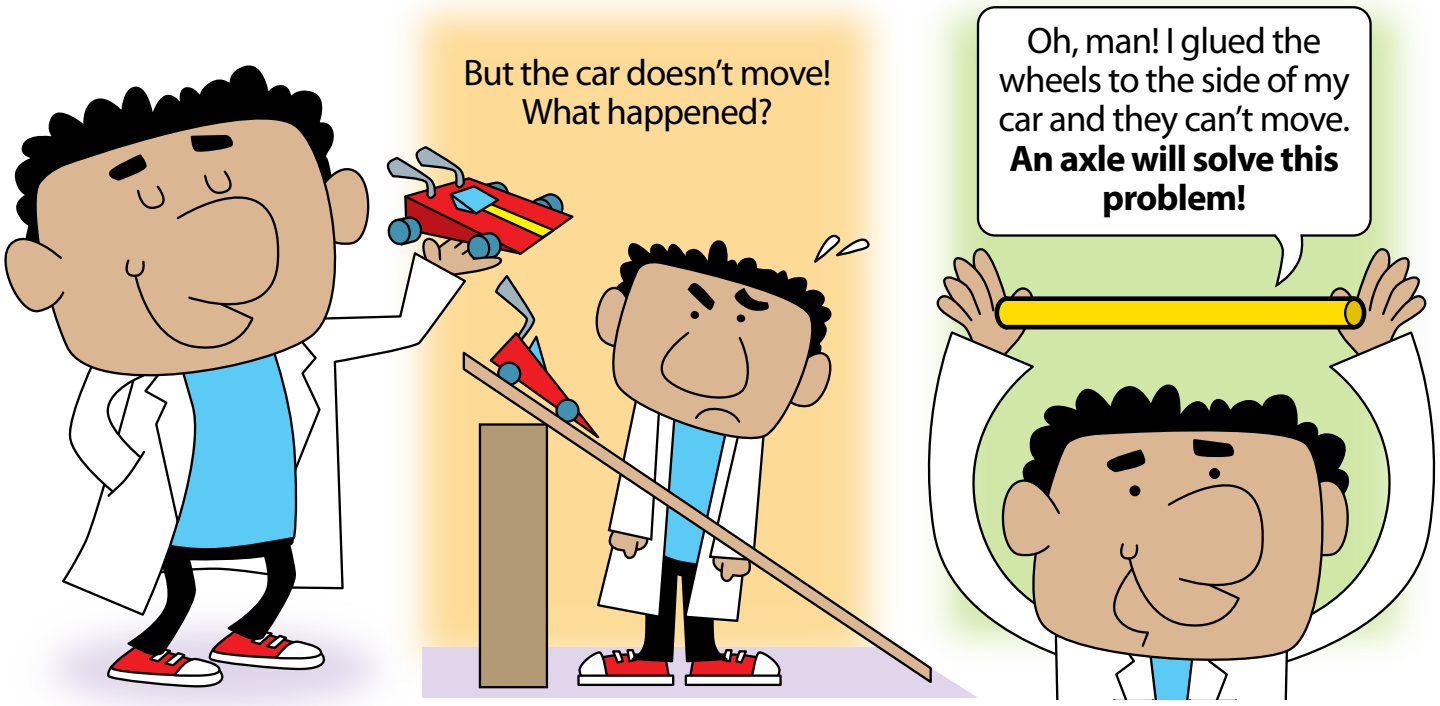
STUDENT NAME:_____

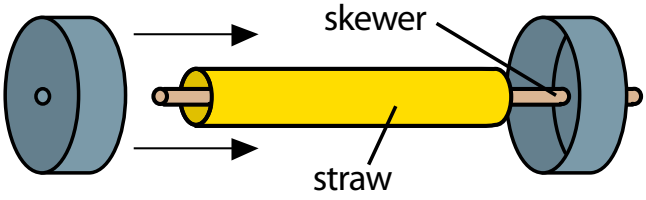
As The Axle Turns

When making a gravity-powered car that will roll quickly down a ramp, you usually add wheels to the vehicle.

Gerry built his gravity-powered racecar, added wheels and put it on the top of the ramp.

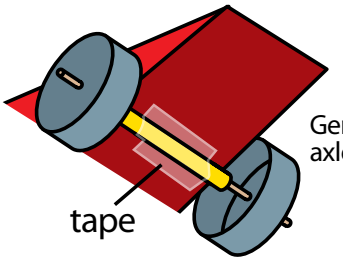


An **axle** is a long cylinder, or rod, that runs through the car to connect the wheels.



Gerry uses a straw and a skewer to make an axle for his gravity-powered racecar!

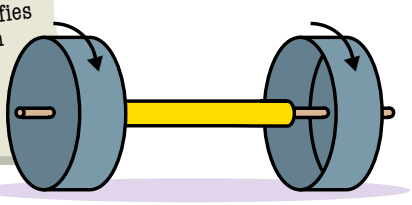
The inside of the straw has low friction, so the skewer can spin easily as gravity pulls the car downward and the tires spin.



Gerry used tape to attach the axle to the underside of the car

Wheel: a round tool that simplifies work by rotating. They need an axle to work efficiently.

Axle: a rod or bar that runs through a hole in a wheel.



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