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**Name(s):**

**Date and subject:**

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**Principle Models: Gears**

**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?

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Find the LEGO® gears shown and count the number of teeth they each have. Start counting from the dot.

Write your answers in the boxes.

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1. **Build A1 (Direction of rotation).**
   Follow Building Instructions A, pages 4 to 8, steps 1 to 7.

2. **Label the gears.**
   Draw lines from the words to the picture of the model.

3. **Try out the model and make observations.**
   Crank the handle one full turn, and count how many times the position marker turns.
   Write your answer here:

   Observe which way the gears turn when you crank the handle, and draw arrows to show the directions they turn in.
1. **Build A2** (Idler gearing).
   Follow Building Instructions A, pages 10 to 14, steps 1 to 8.

2. **Label the gears.**
   Draw lines from the words to the picture of the model.
   
   - Driven gear
   - Idler gear
   - Drive gear

3. **Try out the model and make observations.**
   Crank the handle one full turn, and count how many times the position marker turns. Write your answer here:

   Observe which way the gears turn when you crank the handle, and draw arrows to show the directions they turn in.

1. **Build A3** (Increasing speed of rotation).
   Follow Building Instructions A, pages 16 to 20, steps 1 to 7.

2. **Label the gears.**
   Draw lines from the words to the picture of the model.
   
   - Driven gear
   - Drive gear

3. **Try out the model and make observations.**
   Crank the handle one full turn, and count how many times the position marker turns. Write your answer here:

   Observe which way the gears turn when you crank the handle, and draw arrows to show the directions they turn in.
1. **Build A4** (Decreasing speed of rotation).  
   Follow Building Instructions A, pages 22 to 26, steps 1 to 7.

2. **Label the gears.**  
   Draw lines from the words to the picture of the model.
   - Driven gear
   - Drive gear

3. **Try out the model and make observations.**  
   Count how many times the handle has to turn for the position marker to turn once.  
   Write your answer here:

   Observe which way the gears turn when you crank the handle, and draw arrows to show the directions they turn in.

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1. **Build A5** (At an angle).  
   Follow Building Instructions A, pages 28 to 32, steps 1 to 8.

2. **Label the gears.**  
   Draw lines from the words to the picture of the model.
   - Crown gear
   - Spur gear

3. **Try out the model and make observations.**  
   Count how many times the handle has to turn for the position marker to turn once.  
   Write your answer here:

   Observe which way the gears turn when you crank the handle, and draw arrows to show the directions they turn in.