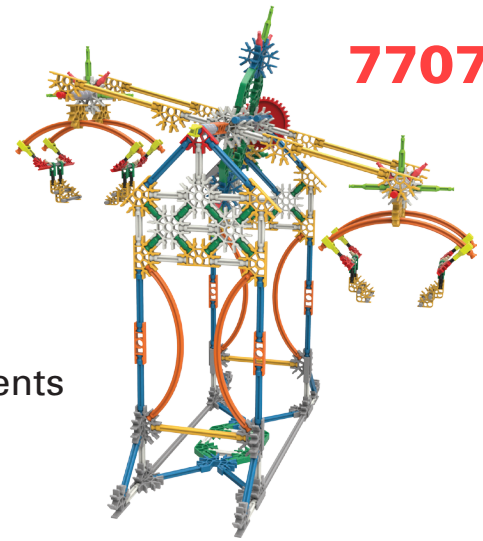


Experiment #3

Turn the Crank of the Boom Ride

77077



Objectives: Investigate how different gear arrangements affect the distance the ride travels

Materials You Will Need:

- built **BOOM RIDE** model
- regular paper or journal
- pen or pencil
- graph paper

PROCESS:

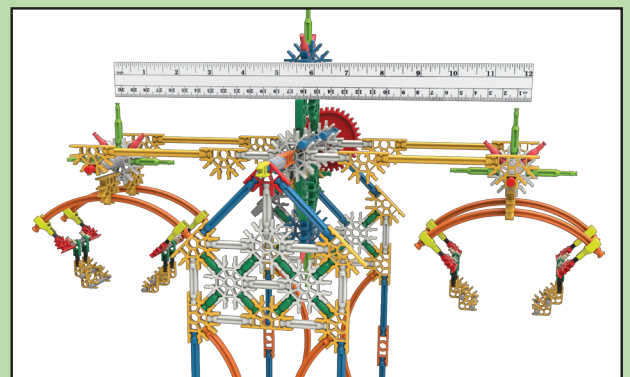
1. Build the **BOOM RIDE** model by following the step-by-step building instructions.
2. Once the model is complete, do the following:
 - a. Predict how far one of the seats would travel for one complete turn of the crank.
 - b. Determine the circumference of the circle made by the hanging seats. Remember that the formula for circumference is:

$$C=2\pi r$$

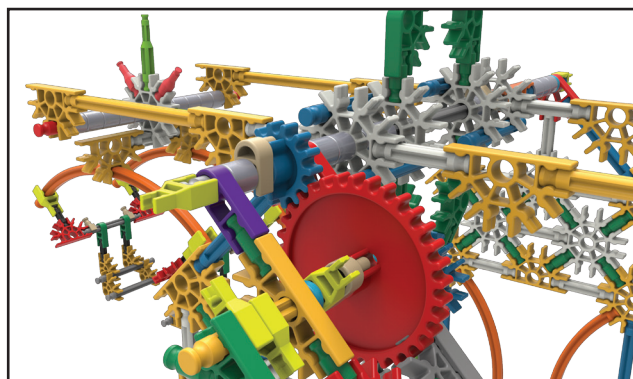


Tip:

Adjust the Boom Ride so that it is parallel to the surface it is sitting on. Measure the distance between the 2 outer sets of seats. This will give you the diameter of the circle; divide by 2 to get the radius.



- c. Place a piece of masking tape on one of the seats that you will follow as the ride turns.
- d. Turn the crank of the model once and note the number of turns the seat with the tape makes.
- e. Complete the 2nd column in the table below by using multiplication and determine the distance traveled by riders for one, two, three, four and five cranks of the handle.
- f. Rebuild the gear assembly so that the blue gear is now on top of the red gear.



- g. Repeat step 2e with your differently geared boom ride. Record your data in the 3rd column in the table below.

Number of Cranks	Distance traveled when the BLUE gear is on top	Distance traveled when the RED gear is on top
0		
2		
3		
4		
5		

- h. Make a side-by-side bar graph of the data on the same set of axes, with the number of cranks on the x-axis and the distances on the y-axis. You should use different color bars for the two versions of the ride.

3. Analysis:

a. How far did the **BOOM RIDE** travel during one turn of the crank for each of the gear configurations?

b. Did the geared-up or geared-down ride travel further during one crank?

c. In what way is gearing-up or gearing-down related to speed?