Experiment #2

Hanging Above the Ground in a Ferris Wheel

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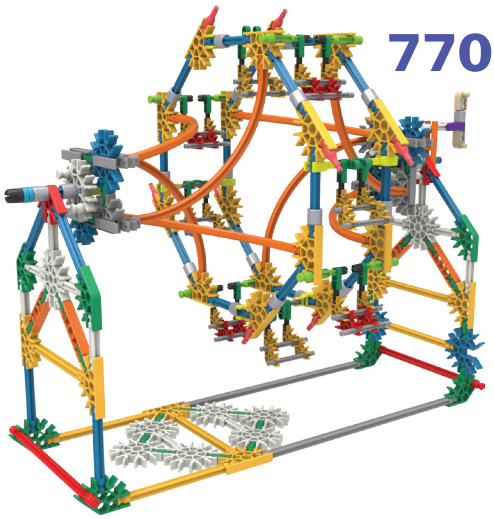


Objectives: Determine if there is any pattern that might be used to demonstrate the changing height of a rider as a ride turns through several rotations

Materials You Will Need:

- built **FERRIS WHEEL** model
- masking tape
- ruler or measuring tape
- pen or pencil
- regular paper or journal
- graph paper

PROCESS:

1. Build the **FERRIS WHEEL** model by following the step-by-step building instructions.

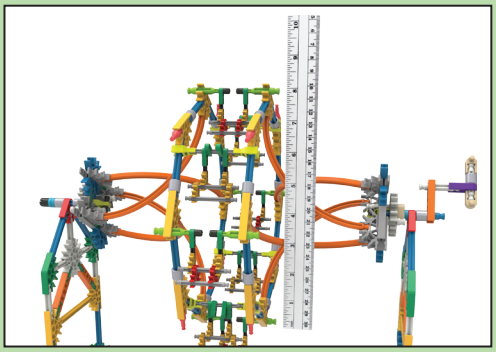
2. First, you should:

   a. Determine the circumference of the circle that a seat makes during one rotation of the ride. Remember that the formula for circumference is:

$$C = 2\pi r$$

Tip:

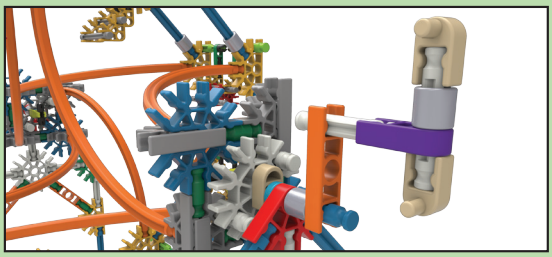
Position the Ferris Wheel so that there is one neon green rod at the very top of the circle and another neon green rod at the very bottom of the circle. Measure the distance between the green rods to get the diameter, then divide by half to get the radius.



b. Figure out a way to stop the ride for measurement purposes each time the seat has moved through 45° or, in other words, each time the ride has completed 1/8th of a rotation.

Tip:

Near the crank handle, you will notice a white 8-connector. As each connection point on this connector comes to the top, the ride will have moved 1/8th of a rotation.



c. Determine the distance traveled by multiplying the fraction of the circle by the circumference calculated in step 2a.

d. Use a ruler to measure the height above the ground, in centimeters, of a specific seat on the ride at the specified measurement points. (Tip: It may be helpful to place a piece of masking tape on the seat you are measuring so it is easier to keep track of.)

Circumference of Ride (cm)	Fraction of the Circle	Distance Traveled (cm)	Height (cm)
	0		
	1/8		
	1/4		
	3/8		
	1/2		
	5/8		
	3/4		
	7/8		
	1		
	1 1/8		
	1 1/4		
	1 3/8		
	1 1/2		
	1 5/8		
	1 3/4		
	1 7/8		
	2		

3. Next, you should:

a. Construct a graph of your data by plotting the fractional turn values on the x-axis, and the distance and height on the y-axis. Different colors should be used to plot distance and height data.

Tip: Use red dots and a red line to plot the distance data and a blue dot and blue line to plot the height data – your analysis will be much easier.

b. Comment on the shape of the lines on your graphs. What pattern did your height data make?