

# Gravity Power Cars Making the GFC Go Farther Student Inquiry Sheet



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

## Investigation #5: What Factors Effect How Far The GCF Travels?

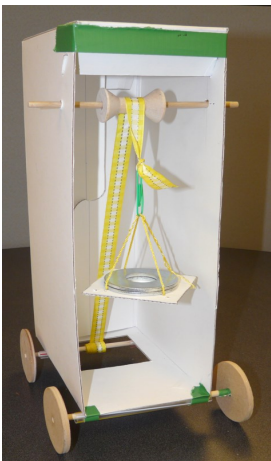
To find out how to make the GFC travel farther, you need to do some experiments or “fair tests.” In a fair test, you change only one thing at a time and see what happens. A “fair test” gives you the most useful answers in an experiment. There are many things you could test to see if you can make your GFC go father. In this investigation, you will look at several different factors.

### Experiment 5-A: How Does The Height The Washers Are Lifted Change The Distance The GFC Travels?

Make some **predictions**:

If your GFC moves 20 cm with 2 washers lifted to 5 cm, how far will it go if:

- The same 2 washers are lifted to 10 cm? \_\_\_\_\_
- The same 2 washers are lifted to 15 cm? \_\_\_\_\_



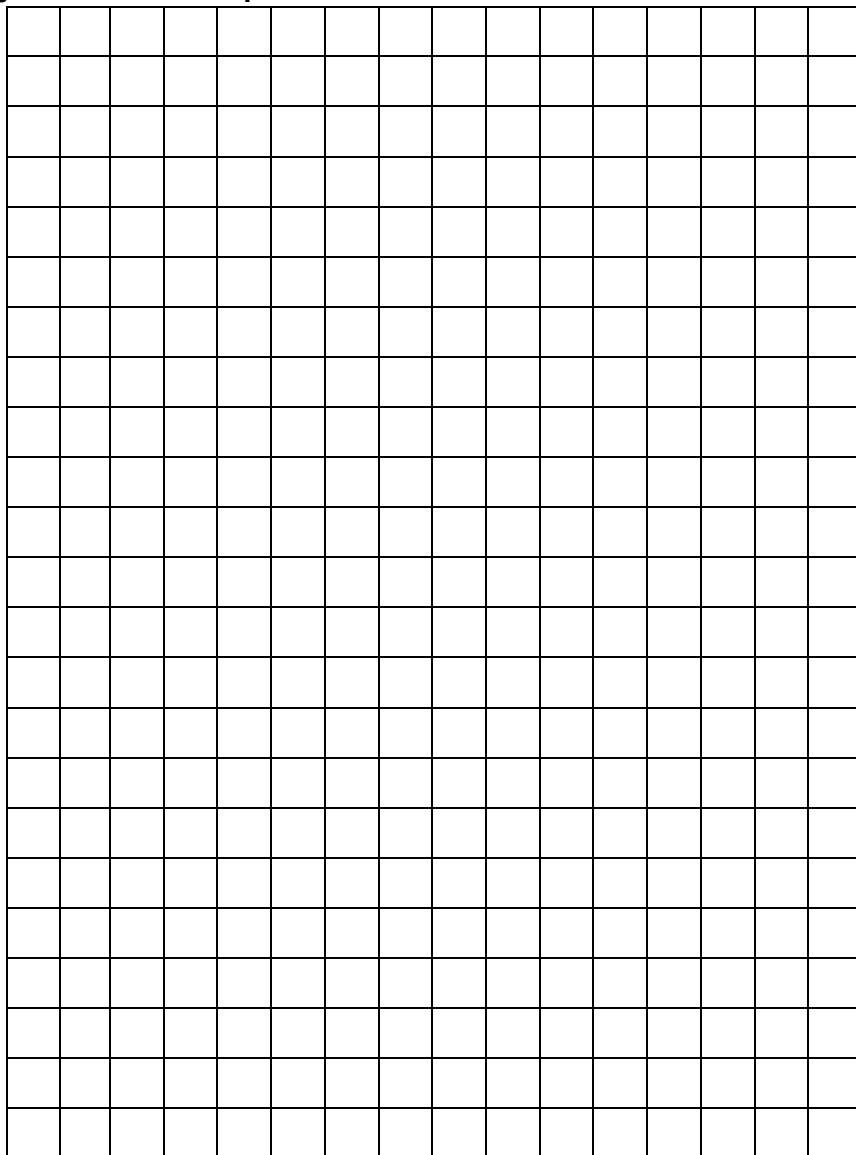
Explain how you are going to conduct your “fair test”. What will you do to test how lifting washers different heights will change the distance the GFC travels? Test at least 3 different heights and record your results below. Make sure to use a flat surface!

Lift washers to different heights to change how far your GFC travels

Distance (cm) traveled by GFC			
Distance traveled (cm)	Washer height (cm)		
	_____cm	_____cm	_____cm
Trial 1			
Trial 2			
Trial 3			
<b>Average</b>			

Graph your results: "Dependence of GFC Distance Traveled on Washer Height"

Distance GFC traveled (m)



Height of washers (cm)

Explain the reason you think that washer height makes a difference on the distance traveled by your GFC.

Make up a rule that is supported by your data about the height of washers and distance traveled by your GFC .

Predict how far the GFC would travel if you continued this test and raised the washers to 30 cm. Explain how you made your prediction.



Check Point

**Experiment 5-B: How Does Additional Weight Added to the GFC Change The Distance The GFC Travels?**

Make some **predictions**:

Imagine that you put 1 N on top of **of your** car and it travels 100 cm in a test run.

- Predict how far your GFC will travel if you put 2 N on top of the car? \_\_\_\_\_cm
- Predict how far it will travel with 3 N on top of the car? \_\_\_\_\_cm



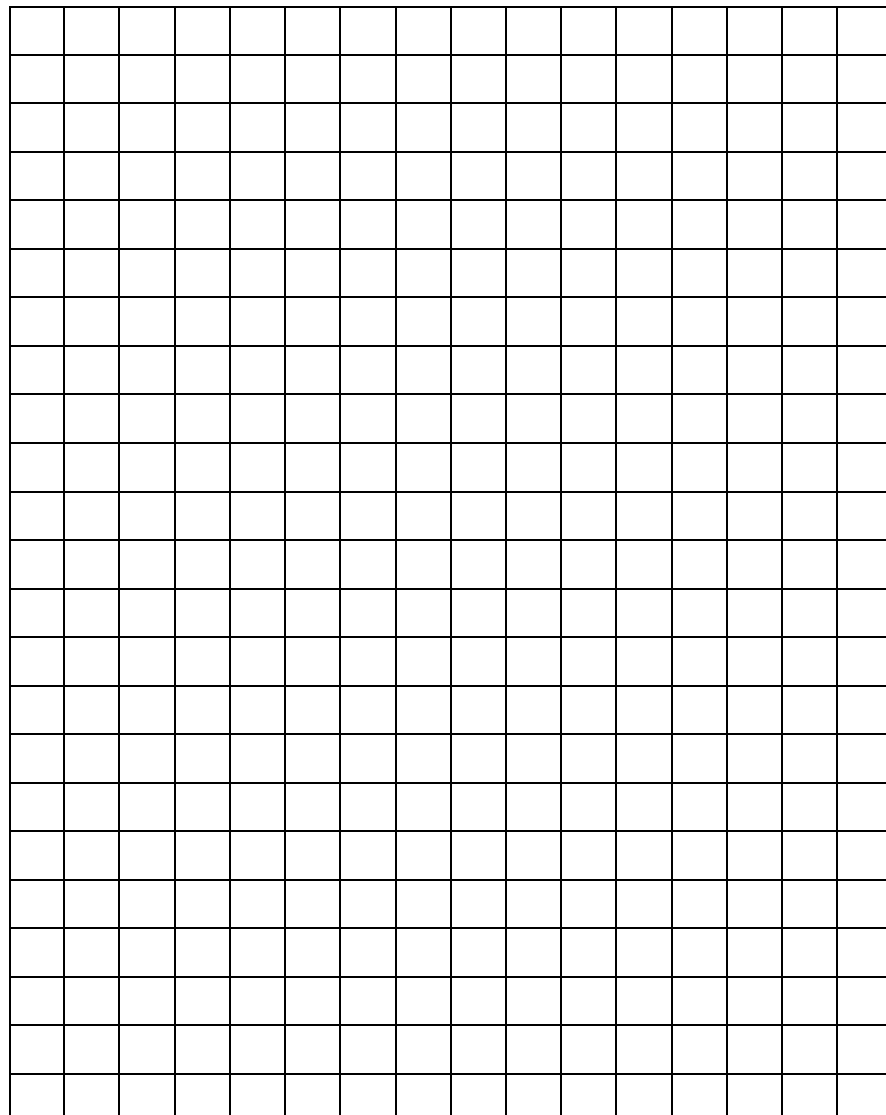
Explain how you are going to conduct your “fair test.” What will you do to test how adding weight to the car changes the distance it will travel?

Add washers on top to change the load weight of your GFC.

Distance (cm) traveled by GFC			
Distance traveled (cm)	Washer weight added to the top of the GFC (N)		
	____N	____N	____N
Trial 1			
Trial 2			
Trial 3			
<b>Average</b>			

Adding weight to the top of the GFC changes the distance it travels. Explain how the weight actually causes the change in distance GFC travels. What is going on?

Graph your results: "Dependence of GFC Distance Traveled on the Washer Weight Added to the GFC"



Make up a rule that is supported by your data about how distance changes as more weight is added to the GFC. Tell how much the distance changes for each unit of weight added.

Predict how far the GFC would travel if you added another amount of weight that you did not test. Tell how much weight you would add and explain how you made your prediction:



**Check  
Point**

**Experiment 5-C: How does the weight of washers on the washer platform change the distance the GFC moves?**

Make some **predictions**:

If your GFC moves 100 cm with 1 N of washers lifted to 10 cm, predict how far will it go if:

3 N of washers are lifted to 10 cm? \_\_\_\_\_

4 N of washers are lifted to 10 cm? \_\_\_\_\_



Add more washers to your platform to change the weight of the washers lifted.

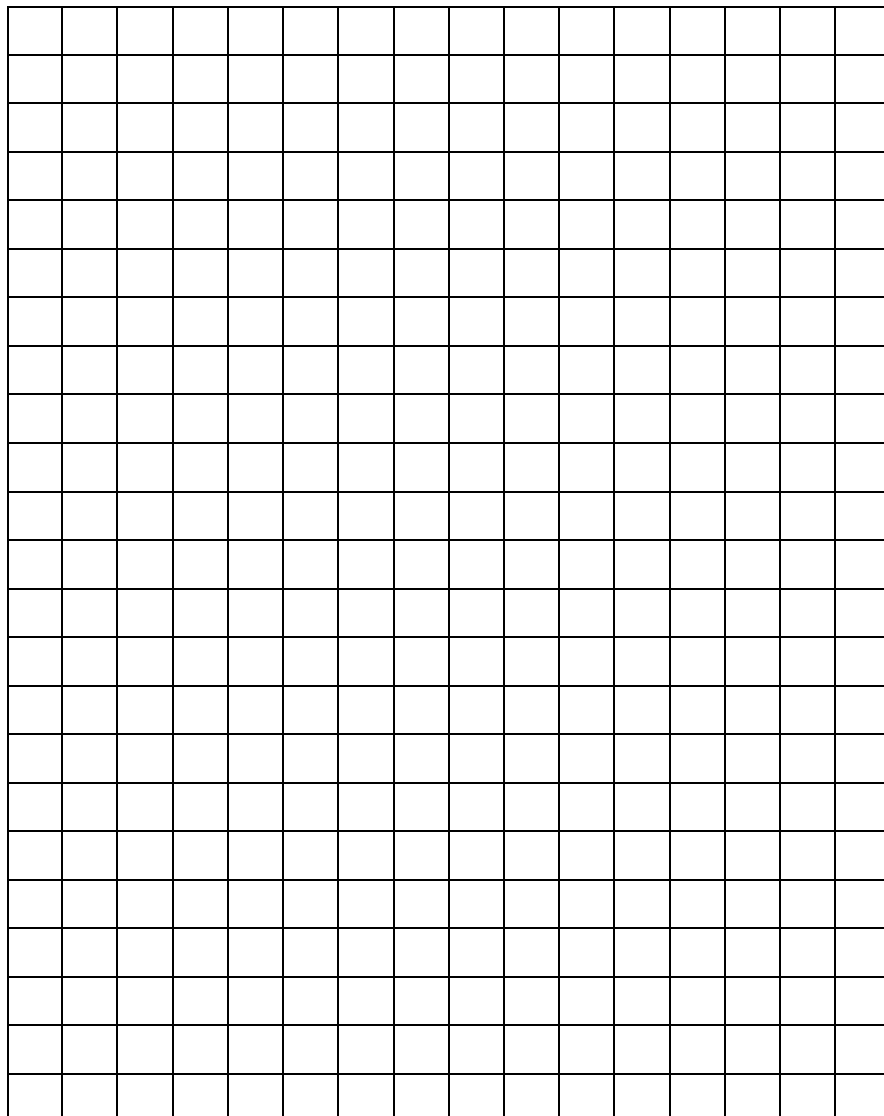


Explain how you are going to conduct your “fair test” to find out how the weight of the washers lifted changes how far the GFC travels?

Data and results:

Explain what happens to the GFC to cause the change in distance the GFC travels because you lifted more washers on the platform:

**Graph your results:**



Make up a rule about how the distance traveled by the GFC changes as the weight of the washers changes. Include how much the distance traveled changes for each amount of weight added on the platform.

Predict how far the GFC would travel if you added another amount of weight to the platform that you did not test. Tell how much weight you would add and explain how you made your prediction:



**Check  
Point**

## Experiment 5-D: How Does the Diameter of the Wheels Change the Distance Traveled by the GFC?

Make a **prediction**:

If your GFC moves 100 cm with wheels that are 5 cm in diameter, how far will it go if you use wheels that are 10 cm in diameter? \_\_\_\_\_



Change the diameter of the wheels on your GFC.

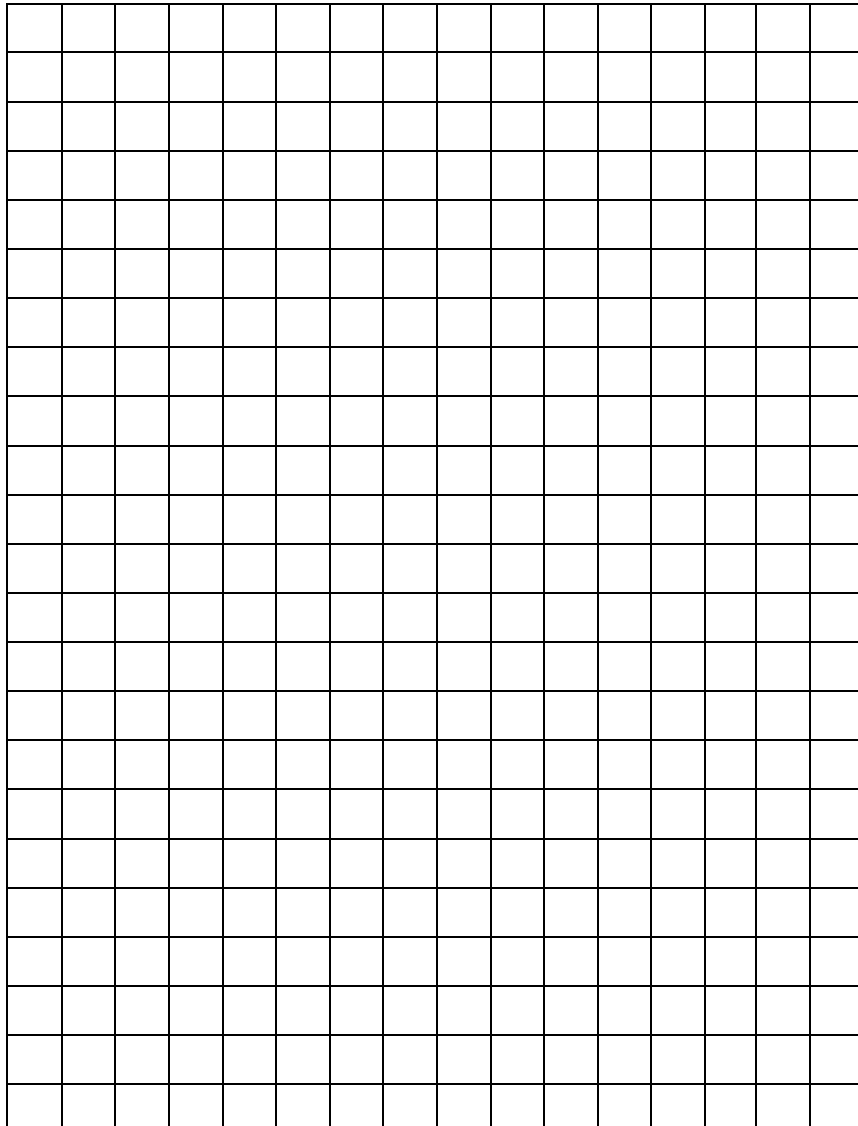


Explain how you are going to conduct your “fair test” What will you do to find out how the diameter of the wheels change the distance the GFC travels? Test at least 2 different wheel diameters and record your results below. Remember to keep the weight of the washer and height the washer is lifted the same for each test.

Data and results:

Explain the reason you think that bigger wheels may cause a change in the distance the GFC travels. You might want to measure how far different size wheels move the car if they turn completely around just once.

**Graph your results:**



Make up a rule about how the distance traveled by the GFC changes as diameter of the wheels change. Include how much the distance traveled changes for each increase of 1 cm wheel diameter.

Predict how far the GFC would travel if you used 20 cm diameter wheels. Explain how you made your prediction:



**Check  
Point**