Forces and Friction

What forces are pulling or pushing on the sled in the picture? Draw an arrow that shows the direction that the force is pulling or pushing on the sled.

Experiment 1:

Hypothesis: What do you think will happen when more washers are added to the hook?

Add washers to the hook. Try this three times with different numbers of washers.

Number of washers on hook	How does the box move? (circle one)		
0	Stays still	Speeds up a little	Speeds up a lot
1	Stays still	Speeds up a little	Speeds up a lot
2	Stays still	Speeds up a little	Speeds up a lot

When more washers are put on the hook, the **force** is (circle one) stronger / weaker / the same.

Experiment 2:

Use 2 washers on the hook.

How can you make the box move more slowly than it did for 2 washers in Experiment 1? Write down some ideas.

Observations:

Change made	How does the box move compared to Experiment 1?

Explain your observations.

Experiment 3:

Using the same number of washers on the hook, add washers into the box on the table. Try this three times with a different number of washers each time.

Number of washers on the hook: _____ (write a number)

Number of washers in the box	How does the box move? (circle one)		
2	Stays still	Speeds up a little	Speeds up a lot
4	Stays still	Speeds up a little	Speeds up a lot
6	Stays still	Speeds up a little	Speeds up a lot

The number of washers in the cup is the same, so the force is (circle one) the same / different for all the trials. The motion of the box (circle one) changes more / changes less / stays the same when there are more washers in it.

Experiment 4:

How does the table feel?	Soft	Rough	Smooth
How does the sandpaper feel?	Soft	Rough	Smooth

Number of washers on the hook: _____ (write a number)

Number of washers in the box: _____ (write a number)

Compare the box's motion on the table and sandpaper			
The box's motion changed more when using:	table	sandpaper	the same for both
The force from the hanging washers is larger when using:	table	sandpaper	the same for both
The friction is larger when using:	table	sandpaper	the same for both
The total force on the box is larger when using:	table	sandpaper	the same for both

Summary:

Check your drawing of the forces on the sled. Using what you learned, make any changes that you want.