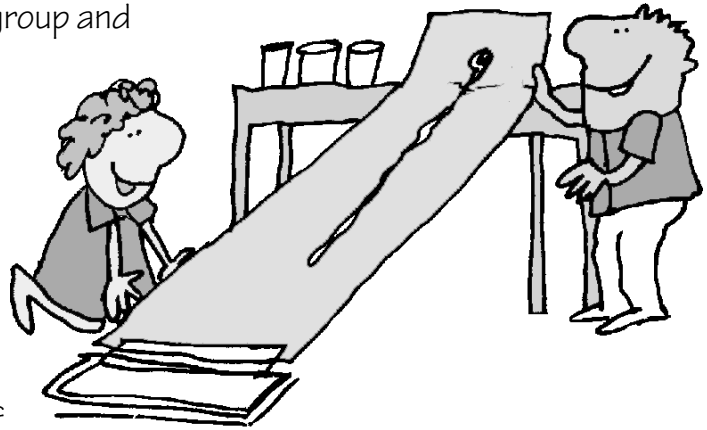


Work Sample Suggestion for On Your Mark

This activity can be completed as a group and then recorded by individuals.

Demonstrate how to complete the activity. Drip one-half cup of room temperature ketchup down a wax paper incline of 45° . Time the movement of the ketchup, marking the side of the wax paper with a post-it™ to show the lowest part of



the oozing ketchup at the end of each ten seconds. At the end of one minute, lower the wax paper to the floor and use a meter stick to measure the distance from the top of the wax paper to each post-it™. Record the information on a table and then graph the six ten-second intervals recorded by the post-its™.

Repeat the activity, making only one change to the experiment. Students can suggest a change or it can be set up ahead of time and suggested by the teacher since the change suggested may not be readily available.

A variable might include:

- warmer ketchup
- colder ketchup
- more ketchup
- less ketchup
- a steeper incline of wax paper
- a shallower incline of wax paper
- a longer incline of wax paper (higher shelf or table)
- a shorter incline of wax paper (lower shelf or table)
- room temperature mustard or barbeque sauce

I ask students to help me write up the FORM and they copy it onto their paper. Then, they describe step by step how to complete the activity for DESIGN. A table is made and next to it a graph that shows the results. The ANALYSIS is written last.

Following this is an example of a write-up for this activity. I tried to fit it on one page to make it easier to present in parts to students or to use as a teacher reference.

On Your Mark

FORM

When I pour one-half cup of cold ketchup from the refrigerator down a 45° incline of wax paper, the ketchup oozes quickly at first (23cm in 10 seconds) and then more slowly, just a few centimeters each ten seconds. Ketchup is very viscous. Viscosity is the property of a material that resists flowing. A viscous liquid like ketchup moves slowly down the incline.

What would happen if I used ketchup that is room temperature? I think that the ketchup will flow more quickly. When I use ketchup that's been sitting out on the table, it pours all over my food.

DESIGN

I am going to:

1. Tape the end of a sheet of wax paper to a shelf and pull out the paper and tape it to the floor so that it is at a 45° angle to the floor.
2. Fill a one-half cup measuring cup with cold ketchup.
3. Pour the ketchup down the incline from the top.
4. Time the flow of the ketchup, marking the bottom of the ketchup every ten seconds for one minute.
5. Repeat 1-4 with room temperature ketchup.

COLLECT

	10s	20s	30s	40s	50s	60s
Cold	23	29	31	34	36	38
Warm	36	42	44.5	46.5	49.5	52.5

ANALYZE

At first, the warm ketchup moves more quickly than the cold ketchup. After the first ten seconds, the two move about the same way. I know this because the lines of the graph are almost parallel. I didn't get the answer I predicted. I think the plan was good. I only changed one thing, temperature. Next time, I would change the kind of ketchup. I think cheaper ketchup drips faster.

How far and fast the ketchup oozed

