Lesson 2 Gravity and Motion

**Objectives:**

1. Review and recall the problem and definition of forces
2. Read and explore gravity
3. Describe how gravity relates to sledding
4. Define criteria for a good sled racer
5. Describe first dream sled designs
6. Practice measuring with tape measure

**Materials**

* Recycled materials for sleds

**Static electricity**: plastic wand/comb, leftovers from hole punch

**Magnets:** magnet and paper clips

* Cardboard ramp
* Tape measures
* Timers
* Lego cars & pennies
* Book: Cobb, Vicki (2004). I Fall Down. Harper Collins.

**Procedure**

Review & Explain

1. Demonstrate and discuss: Teacher questions: What happens when I move a desk? Play on seesaw, etc??? What is the force that moves it?

Part 1: Exploring Gravity

1. Teacher mentions: “We can create forces without touching objects too.”
2. Demonstrate and discuss: Static electricity. “What happens when we charge up this wand and hold it near the paper?” (paper pops up and moves towards the wand)
3. Demonstrate and discuss: Magnets: “What happens when we take two same ends of magnet?”- they created a force that pushes away. When we bring magnet close to a paperclip- pulled.
4. There’s another force on earth- called gravity?
5. Read Vicki Cobb’s book and try out some of her ideas to see what happens.
   1. Ask the children to predict, “What do you think will happen?”
6. Demonstrate that this happens on our hill ramp too. Show with our moving objects from the previous lesson
7. When our sleds move- it is gravity that makes them move down the hill

Part 2: Exploring Mass

1. Teacher Discusion: “Will more or less mass make them go faster? Slower? Farther?”
   1. Set up Lego car without pennies
   2. Add pennies to the car
      1. Measuring tape in inches
         1. Show some helpers how to measure.
         2. Look together and practice measuring and writing numbers on board.
   3. Observe what happens with the two cars?
      1. Ask what is the difference between the two cars? (One has extra stuff making it have a larger weight)
      2. Observe and describe together: what happened?
2. Heavier objects go farther down a ramp
   1. So how will this help us think about building our sleds? Would we want heavy or lite sleds?
3. Start to pick out materials for sleds.
4. Explaining: (As the teacher moves through the group, ask how they will make heavy sleds? How does gravity work with sleds?

Part 4: What other else have you noticed about sleds:

1. Students bring in their sled pictures and experiences and explain what they know about sled shape and materials

* Shapes- Look at pictures from one another. Guiding questions for the teacher to help children focus on attributes:
* “Shape is it most like? What do you notice about the edges? What do you notice about the bottom? Sides? What are some reasons do we think? (some have runners).
* As you design sleds today think about shapes you want to make. What are some ways to give our sleds some weight?”