

**Saturday Science, Fall 2011 - Grade 3-4**  
School of Education, Indiana University, Bloomington

**Instructors: Mousumi De and Susan Hawkins**

**Pre-Test: Force and Motion**

**What do you know about the things that move through the air?**



**Draw the ball's path of motion.**

**What causes the force behind the ball's motion? Write or draw your answer.**



**Draw the path of the bird's motion.**

**What causes the force behind the bird's motion? Write or draw your answer.**

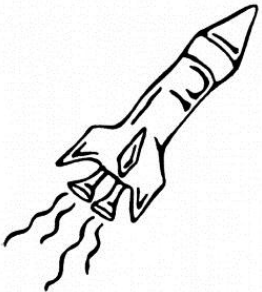


**Draw the path of the plane's motion.**

**What causes the force of the plane's movement:  
Write or draw your answer.**

**Draw the path of the rocket's motion.**

**What causes the force of the rocket's movement:  
Write or draw your answer.**



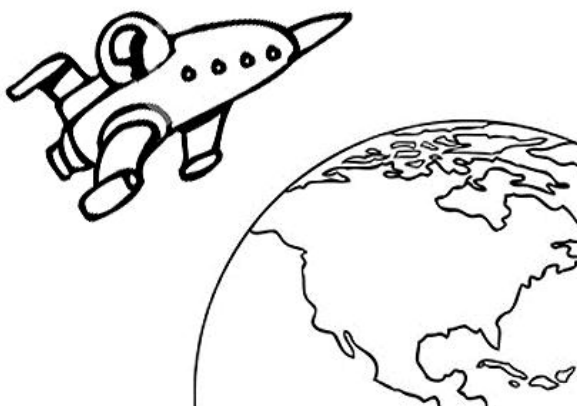
**What do you think?**



**What does gravity have to do with an apple falling from a tree?**



**What does gravity have to do with birds flying in the air?**



**What does gravity have to do with a spaceship orbiting around the earth?**



**What do you think?**

**What does gravity have to do with an astronaut on the moon?**



**What will happen to the coin if you flick the cardboard with your finger?  
Why?**



**What do you think?**

**Which cart is harder to start moving? Which cart is harder to stop moving?  
Why?**



JIM's ball



SAM's ball

**Whose ball will go faster? Why?**



SAM's small stone



SAM's big stone

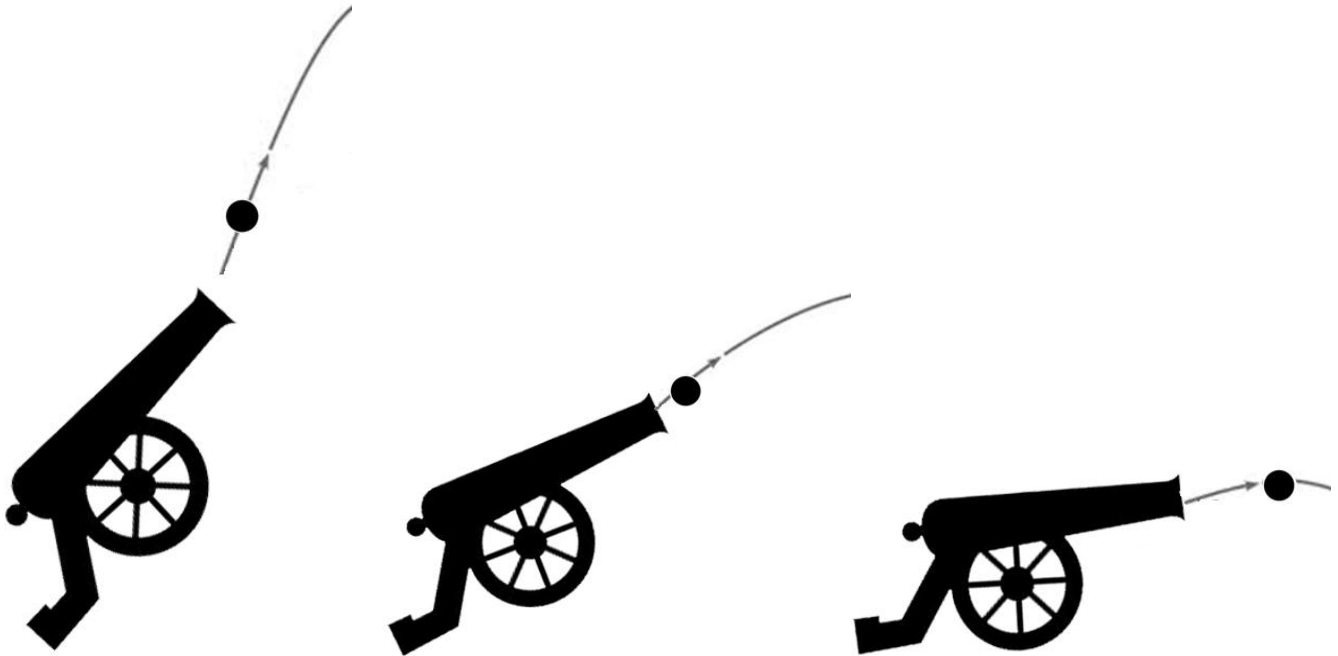
**Which stone will hit harder? Why?**





**Both carts are let go at the top of a hill. Which one will go faster? Why?**

**What do you think?**

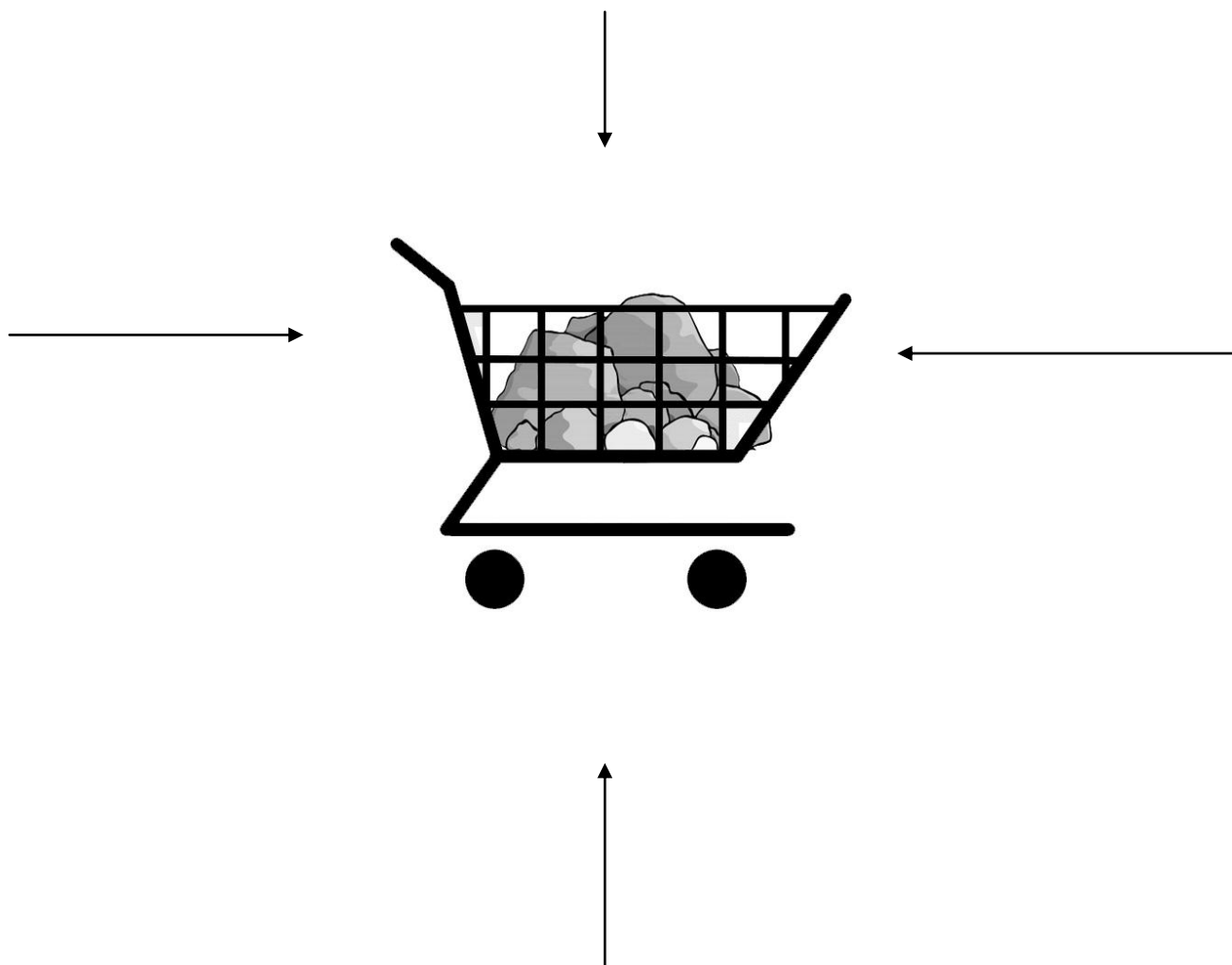


**Which cannon ball will go furthest? Why?**

## In Class Test

### Forces on the Ground

What forces are acting on this cart from different directions?



**In Class Test**

**Forces in the Air**

**What forces are acting on this plane from different directions?**

