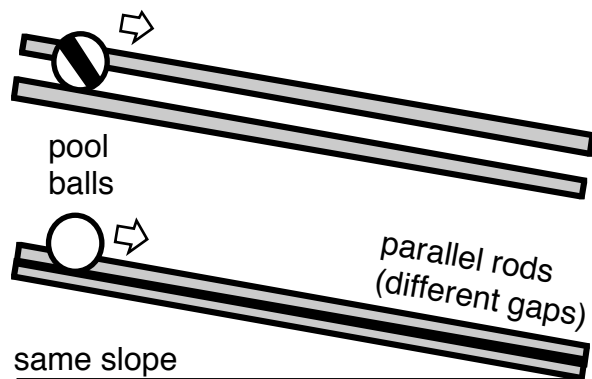*Name_____*

Rotational Kinetic Energy

Consider two systems of inclined rods and billiard balls, with the same slope and same initial height, but with different gaps between the (frictionless) rods.

pool
balls

parallel rods
(different gaps)

same slope

1. Which ball had more initial PE_{grav}?
    Which ball has more final PE_{grav}?

2. Which ball has:
    (a) more translational *KE* (depends on velocity *v*);
    (b) more rotational *KE* (depends on rotational speed ω);
    by the time it reaches its final state, at the bottom of the ramp?
    What did you observe that tells you this?.

3. Draw two energy diagrams, one for each ball, and use this to explain in words why these balls act differently. Explain how the energy interaction diagram of the "winning" billiard ball will differ than the "losing" ball.

Soup can derby
4. Draw two energy diagrams, one for either can, and explain in words whether a can of watery broth or a can of creamy soup will win a downhill race.

cans of soup