

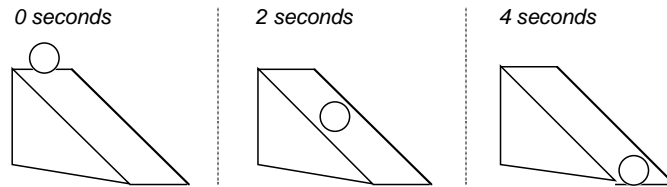
THINKING about MOTION

Name _____

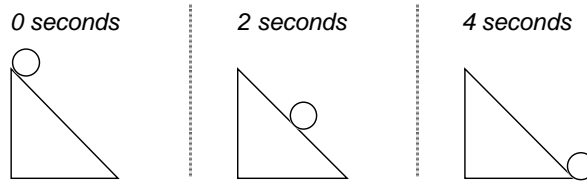
Teacher _____

The following questions have to do with balls rolling down ramps. The pictures below first show the ramp at an angle, and below that is a ramp from the side.

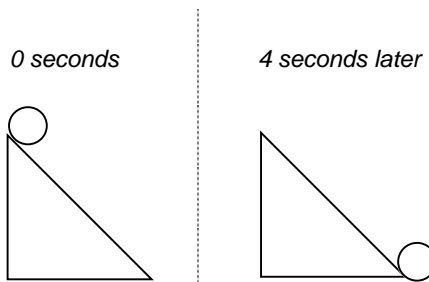
angled view



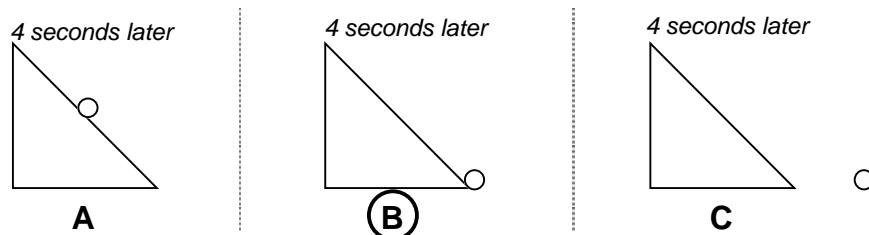
side view



Here is what happened when a ball with a mass of 5 grams was placed at the top of the ramp and rolled down.

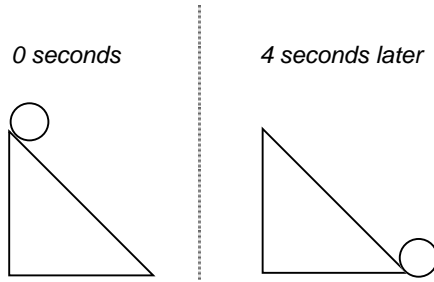


QUESTION 1: If a light ball with a mass of only 1 gram started at the top of the same ramp, where do you think it would be after 4 seconds?

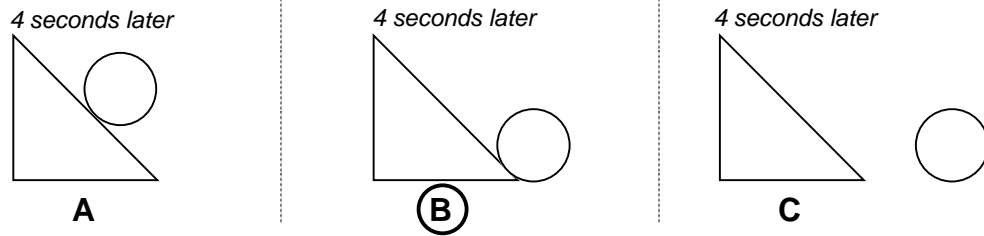


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Here is what happened when a ball with a mass of 5 grams rolled down the ramp.

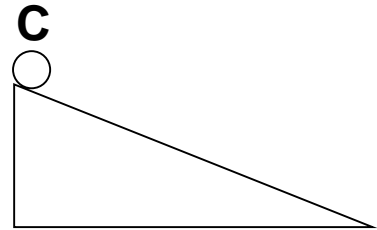
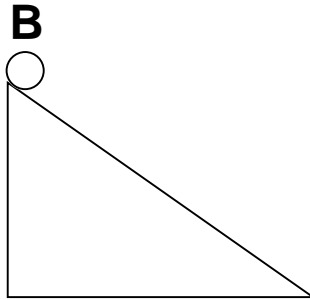
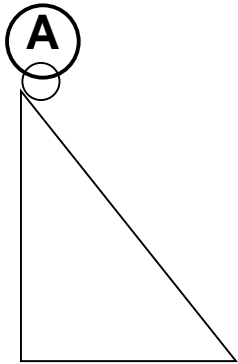


QUESTION 2: If we used a heavy ball with a mass of 10 grams on the same ramp, where do you think the ball would be after 4 seconds?



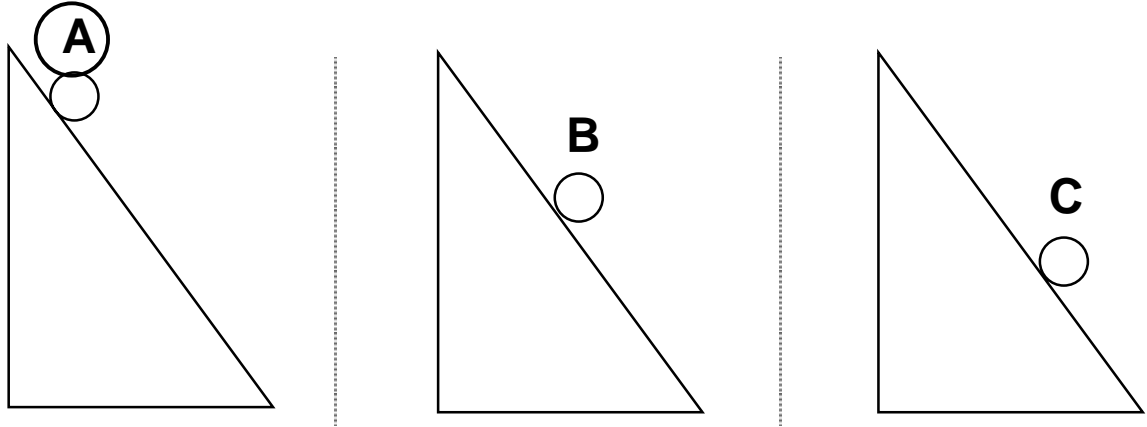
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QUESTION 3: Here are three balls on three ramps.
The balls are of the same type and size.
The ramps are different heights but the same length.
If all the balls started at the same time, which ball would be moving the fastest when it got to the end of the ramp?



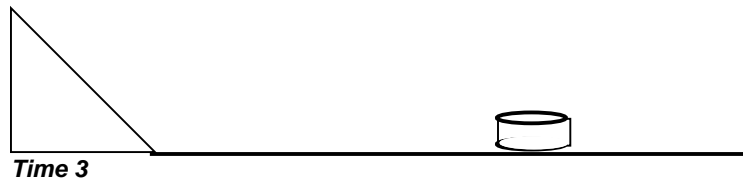
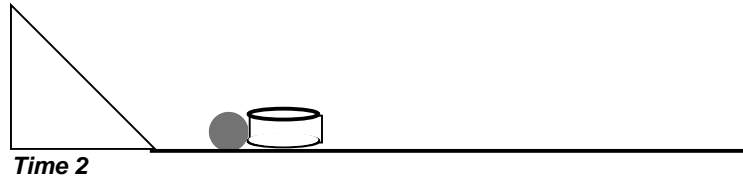
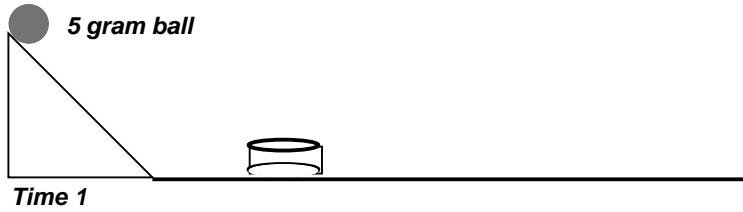
THINKING about MOTION

QUESTION 4: Here are three balls on three ramps.
The balls and ramps are of the same type and size.
The balls are at different starting points on each ramp.
If all the balls started at the same time, which ball would be moving the fastest when it got to the end of the ramp?

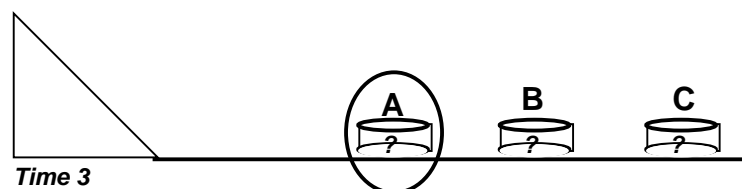
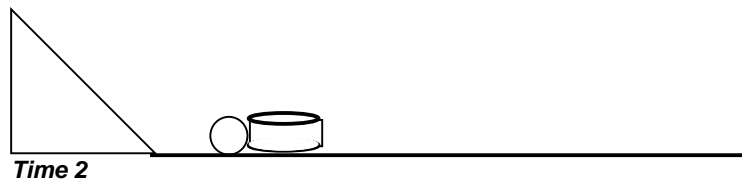
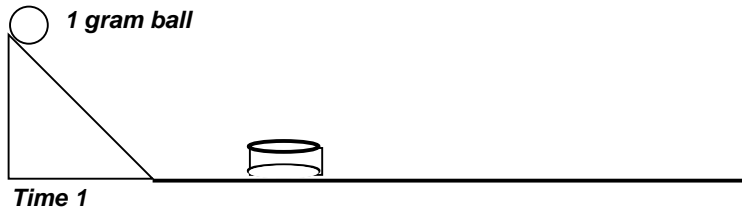


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The drawings below show what happened when a 5 gram ball rolled off a ramp and hit a can: it moved the can forward, and the ball rolled off to the side.

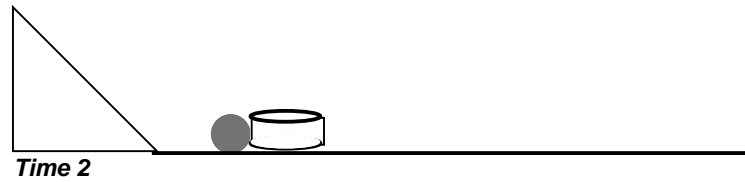
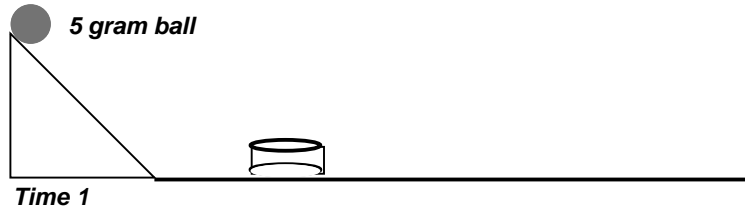


QUESTION 5: Where do you think the can would end up if the same thing happened with a ball of the same size but much lighter, only 1 gram?

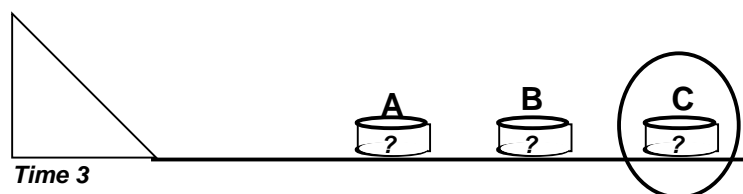
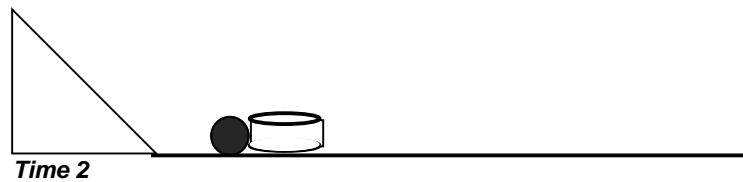
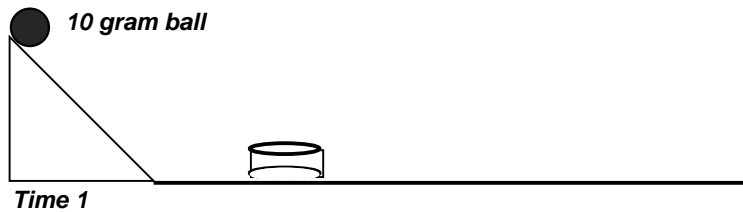


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The drawings below show what happened when a 5 gram ball rolled off a ramp and hit a can: it moved the can forward, and the ball rolled off to the side.



QUESTION 6: Where do you think the can would end up if the same thing happened with a ball of the same size but much heavier - 10 grams?



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QUESTION 7: The table below shows the amount of time it took for a small ball to roll down a ramp. The same ball on the same ramp was measured 4 times or in 4 trials.

The same ball was rolled down the same ramp a 5th time.

How long do you think might it have taken the ball to get to the end of the ramp the 5th time? Write your response in the table.

	Time for Ball 1
Trial 1	3 seconds
Trial 2	2 seconds
Trial 3	2 seconds
Trial 4	3 seconds
Trial 5	? _____

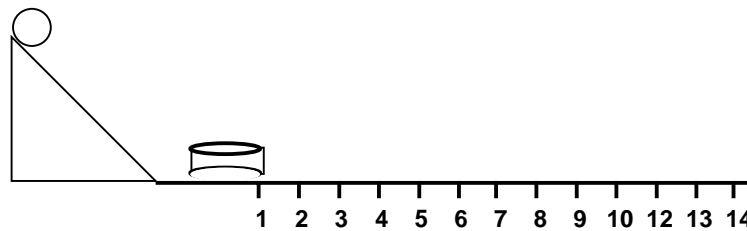
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QUESTION 8: The picture below shows the materials used when a ball rolls down a ramp, hits a can, and moves the can forward. Each time the ball hits the can and moves it, the distance the can moves is measured.

This is done with balls of three different masses:

- ☺ a light ball of 1 gram,
- ☹ a medium ball of 5 grams, and
- ☹ a heavy ball of 10 grams.

What distances do you think might have been measured for Ball 3 that weighed 10 grams? Write your response in the table.



	Ball 1  1 gram	Ball 2  5 grams	Ball 3  10 grams
Trial 1	1 centimeter	6 centimeters	? _____
Trial 2	2 centimeters	6 centimeters	? _____
Trial 3	2 centimeters	5 centimeters	? _____

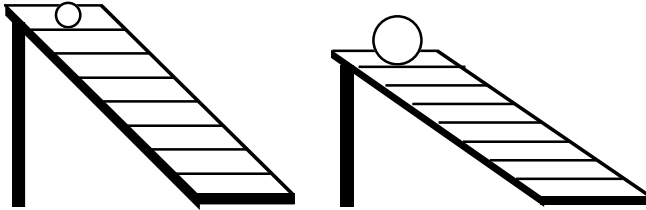
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QUESTION 9: The pictures in this question show the ramp in a different way. The ramps are shown from the angled view.

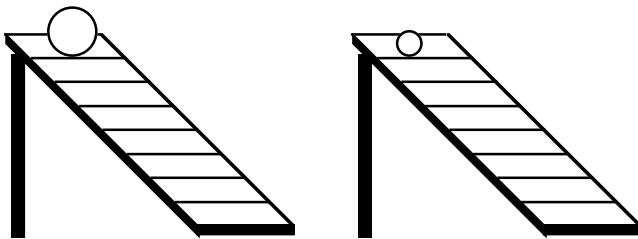
When comparing how fast two balls roll down a ramp it is important to run a fair test.

Each picture below shows how two balls will be compared. Do you think if they are compared it will be a fair test?

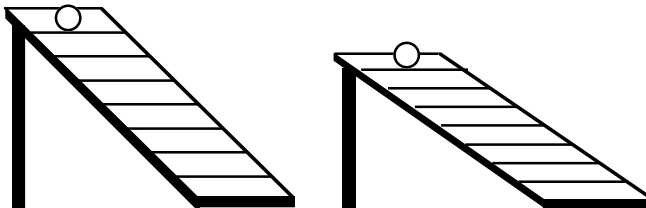
In each case, tell whether you think the picture shows the setup for a fair test. Circle your response.



YES — fair test NO — not a fair test



YES — fair test NO — not a fair test



YES — fair test NO — not a fair test

THINKING about MOTION