

Handout

Questions:

1. If you drop the pendulum without pushing, does it ever get any higher than when you dropped it?
No, because then it would have more potential energy than when it started, and the pendulum has no way of gaining energy.
2. Where in its swing is the pendulum the fastest?
At the bottom of the swing/in the middle.
3. Where in its swing is the pendulum the slowest?
At the top/end of the swing.
4. When does it have the most potential energy?
At the highest point, at the top of the swing.
5. When does it have the most kinetic energy?
At the lowest point, when it is fastest.
6. How many swings does it take for the pendulum to stop moving?
This will vary.
7. Try again with the heavier object. Does it move any faster when you drop it from the same height?
No.
8. How many swings does it take for the heavier pendulum to stop moving?
This will vary, but should be more than the first one.
9. Which do you think had more energy to start, the heavier or the lighter pendulum?
The heavier pendulum.
10. Where do you think the energy went?. Can you think of a way to test that? Describe an experiment that could test your hypothesis.
Answers will vary, the point is to show evidence of scientific thinking. The “right” answer is that Kinetic energy was transferred to air molecules because the pendulum has to push them out of its way as it swings. To test this, you can try putting a ‘sail’ on the pendulum.

BONUS: Try it with a water bottle, filled to be as heavy as your heaviest object. How many swings does the bottle take to stop moving?

This will vary, but it will be fewer than the heavy object.

BONUS 2: What do you think the water is doing in the bottle that could take away kinetic energy and slow down the pendulum?

The water is sloshing. The sloshing is a form of kinetic energy that gets trapped in the water instead of the swing of the pendulum.