MECHANICAL ADVANTAGE PRACTICE PROBLEMS, IPSH

Answer the following questions in your science notebook. Either restate the question in your answer or, in the case of math, show all of your work.

1. If you want to pry the lid off a paint can, will it require less force to use a long screwdriver or a short screwdriver? Explain.

2. Tightening a screw with a larger spacing between its threads requires fewer turns of a screwdriver than tightening a screw with smaller thread spacing. What is a disadvantage of the screw with larger thread spacing?

3. What type of simple machine is a water faucet handle? Is the output force larger or smaller than the input force?

4. A woman drives her car up onto wheel ramps to perform some repairs. If she drives a distance of 1.8 meters along the ramp to raise the car 0.3 meter, what is the ideal mechanical advantage of the wheel ramps?

5. Once you've calculated the mechanical advantage in #4, explain what it means for the woman driving the car to have a mechanical of that much.

6. A student working in a grocery store after school pushes several grocery carts together along a ramp. The ramp is 3 meters long and rises 0.5 meter. What is the ideal mechanical advantage of the ramp?

7. When the pedals of a bicycle move through a distance of 0.25 m, the rear wheel of the bicycle moves 1.0 m. What is the ideal mechanical advantage of the bicycle?

8. The ideal mechanical advantage of a simple machine is 2.5. If the output distance of the machine is 1.0 m, what is the input distance?

9. Why is the actual mechanical advantage of a machine always less than its ideal mechanical advantage?

10. Imagine you have a younger brother who weighs half as much as you do. Design a seesaw you could use together. Create a model of your seesaw design and label it to show the distances that you and your brother must sit from the fulcrum. Explain why you chose the fulcrum position as you did.

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