Work and Simple Machines

In your learning journal, create the following entries.

Work and Simple Machines

Learning targets: At the end of this mini-unit, I will be able to

- Explain the equation W=fd
- Calculate the mechanical advantage of at least two simple machines
- Identify simple machines used in everyday life

Activity log

Date	Learning activity – *Be specific*	# of minutes spent on activity (round to nearest 5)
	(*add as many rows as needed*)	

Overview of the tasks: In a few sentences, describe the tasks you are being asked to do (see below).

Background research: Review the following Bozeman video to learn more about simple machines and use the information found there to answer the following questions. You may use other reliable sources for information, too, if you like. You are encouraged to tell other Honors PS ELO students about these sources by posting them on Edmodo.

The link: Bozeman Science: Simple Machines http://www.bozemanscience.com/simple-machines

The questions:

1) What is a machine?
2) Compare complex v. simple machines.
3) Define what a simple machine is.
4) What are the six simple machines?
5) Why can all six be categorized as either a lever or an inclined plane?
6) Compare input force and output force. How do they relate to mechanical advantage?
7) Explain the following (pay attention to the capital [=big] v. lower case [=small] letters): Fd=fD
8) What is efficiency, and why doesn't a 100% efficient simple machine exist?

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Task #1: Complete any two out of the four experiments described in the provided lab packet (this is available in hardcopy only). The equipment for experiments 1+2 will be located in Mrs. Johnson's classroom (212). The equipment for experiments 3+4 will be located in Ms. Wood's classroom (108). Students should, with teacher permission, visit either classroom to conduct their experiments. Productive and respectful group work is encouraged.

<u>Documentation</u>: Complete the data tables and answer the post-lab questions provided on the handout. You may can write answers in by hand, then photograph or scan the pages to insert them into your Google Doc journal. Alternatively, you can recreate the data tables and questions and fill them in directly on your Google Doc.

Task #2: Photograph at least 10 simple machines found in or around your house or another place where you spend time. Classify each one according to the type of simple machine it is. If it's a lever or pulley, identify which type. Try to get all six types of simple machines, and at least two different types of levers.

<u>Documentation</u>: 10 of your own photos of simple machines, labeled with their classifications.

Summary of learning:

Respond to the following prompts in your learning journal:
A. Cite three different examples of how a simple machine reduces the force a person has to do in order to accomplish a job.
B. For three different machines, identify the factors that result in reducing its mechanical advantage.
C. Pretend you are heading off to live in a cabin in the wilderness for three months. You can take only ONE simple machine with you to help you survive. Which one would you take with you? Justify your choice.

Bring your lab packet to our next whole group meeting for discussion of your findings.

If you are having trouble transferring your photos from your phone to your Google drive, consider downloading an app that will allow you to save your photos in the Cloud. A very good one is Dropbox. It is free and easy to use. The following links can help you learn more about using this tool.

https://www.dropbox.com/tour -- A quick-read overview of what Dropbox is with links to get you started

https://www.dropbox.com/ -- click here to go ahead and sign up for your free account

https://www.youtube.com/watch?v=29qfd5zDU8A -- very good video explanation, 19 minutes long but worth the time

Honors Physical Science ELO