Name:_____ Date:____/___/_____

Hydraulic Machines

1. What do we mean when we say that a machine is "hydraulic"?

_____

_____

2. Fill in the gaps by crossing out the incorrect phrases:

   There are the four key properties of liquids that are important to remember when looking at hydraulic machines:

   - Liquids will always (flow to take the shape of their container/ keep the same shape) no matter what container you use.
   - If you have a fixed amount of liquid, then its volume (can change / will always stays the same) when pressure is applied to it.
   - The pressure in a fluid (acts in all directions / acts in the direction of the applied force).
   - If a constant force acts throughout a liquid, the pressure (can vary / stays the same) throughout the liquid.

   Each of these properties can be explained by thinking of the way particles that make up the fluid move and interact with each other. How?

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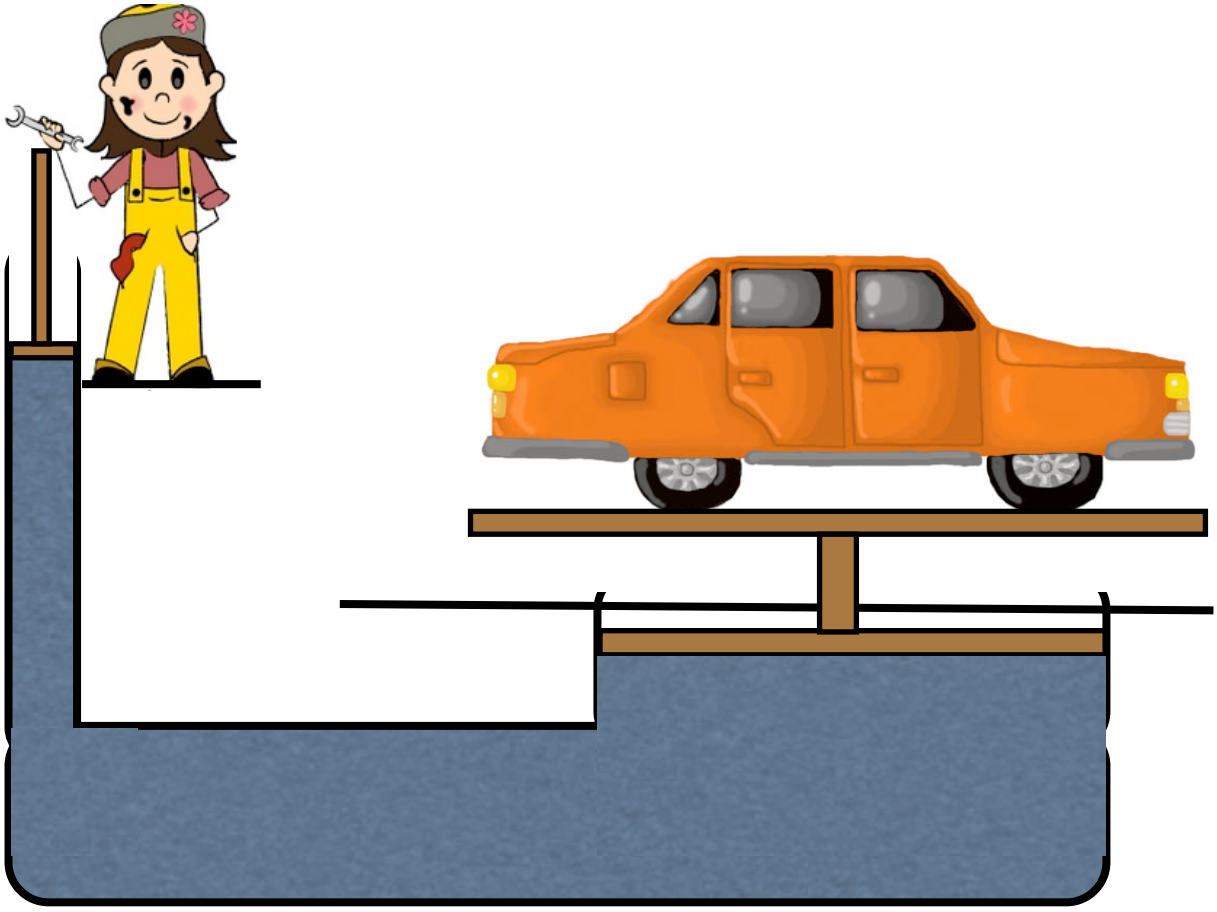
   _____

   _____

3. A mechanic wants to inspect the bottom of a car for a leak. She tries to lift the car using a hydraulic lift.

   a) On the diagram overleaf, draw and label arrows to show the direction in which each of the following forces act:

      - The weight of the car acting on its piston
      - The force exerted by the mechanic on her piston
      - The hydraulic force of the liquid acting on the car's piston



b) The area underneath the mechanic's piston is $0.1m^2$, and the area underneath the car's piston is $10m^2$. If the car weighs 1000kg, how much force does the mechanic need to apply to lift it? (Hint: remember force is measured in Newtons, not kilograms!)

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Bonus question

c) If the mechanic pushes her piston down by 2 metres, by what distance is the car lifted?

_____

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_____

_____

4. Now draw and describe another example of a hydraulic machine. This could be something that you researched yourself, an idea we discussed in class or an invention of your own. Try to label your diagram with the key features of the machine.