Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Simple Machines Review**

**Part A:** Begin by matching the simple machines to their purpose, job, and a real life object which has that simple machine in it. Use the cards that have been given to your group and record your findings in the diagram below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Picture*** | ***Purpose*** | ***Example of a job*** | ***In a real object…*** |
| ***Lever*** |  |  |  |  |
| ***Wedge*** |  |  |  |  |
| ***Inclined plane*** |  |  |  |  |
| ***Wheel and axle*** |  |  |  |  |
| ***Screw*** |  |  |  |  |
| ***Pulley*** |  |  |  |  |

**Part B:** Within your group, read the “Simple Machines Used in Cars” article. It discusses simple machines in the world around us. It is sort of the “why do we care” part of all of this! Answer the questions below as you are reading with your group.

1. What is a simple machine?
2. What is a complex machine?
3. Why is a car an excellent example of a complex machine?
4. What is an inclined plane?
5. The article gives a list of examples of inclined planes – but how might you use an inclined plane with a car? (Hint: It isn’t part of the car itself)
6. What is a lever?
7. What is an example of a lever in a car?
8. What is a wedge?
9. When might a wedge be used with a car?
10. What is a wheel and axle?
11. Where are the two places a wheel and axle can be found in a car?
12. What is a screw?
13. Where is a screw found in a car?

**Simple Machines Used in Cars**

Simple machines are things we use every day; a **simple machine** is something without a motor that helps to pull, lift, move, or change the direction of another object. Our bodies can become simple machines, too, when used in a certain way. We use our arms to pick things up and move them about, and our arm as a lever; there are so many more ways that your body is a machine. An example of a simple machine seen often is a ramp. A ramp can be used to make moving a box from a truck to the ground easier.

When simple machines work together, it is called a **complex machine**. A complex machine we use almost every day is a car. Cars are considered complex machines because they have motors and are composed of several simple machines to help make them run. Let's explore the six types of simple machines that we see in cars: inclined planes, levers, pulleys, wedges, wheels and axles, and screws.

**Inclined Plane -** An inclined plane is a sloped surface that can be used to move an object across a distance. Inclined planes are sloped, so that the force needed to push or pull an object is reduced. The ramp to move a box from the truck onto the ground talked about earlier is an example of an inclined plane. Another example is a playground slide. A slide moves a person from the top of the playground set to the bottom of it. The person at the top needs a very small push (or force) and the inclined plane helps do the rest.

**Lever -** A lever is a stick that moves around a fixed point. The fixed point of the lever is called the **fulcrum**. Levers are one the most common types of simple machines and can be spotted everywhere. A see saw is a type of lever. The board you sit on is the "stick" portion of the lever and the piece in the middle the stick moves around is the fulcrum. When someone sits down on one side, the stick moves around the fulcrum. The fulcrum of a lever is not always in the same place. If a ruler is placed on a can of paint to pry the lid open, the fulcrum is where the ruler and the paint can meet because that is the fixed point. A lever in the car could be the stick you pull for the windshield wipers, or the windshield wipers themselves.

**Pulley-** A pulley is a rope in a grooved wheel. Pulleys are used to change the direction of force and lift or lower an object. When the string on a window is pulled to open or close it, the simple machine that is being used is a pulley. Every time you go up or down in an elevator a very strong rope and wheel are pulling it up or slowly letting it down.

**Wedge -**A wedge is similar inclined plane but a wedge is thick on one end and thin on the other; it is like having two inclined planes back to back. Inclined planes are fixed in place where a wedge moves to help force things apart. When a teacher places a doorstop in the classroom door to keep it open, the block of wood being used is a wedge. One end of the doorstop is thick and the other end is thin. It creates force between the door and the floor to wedge it open. An axe is also a wedge; it uses force to split pieces of wood apart. If a mechanic is working on a car which has brake issues, often times they will place a wedge shaped piece of wood under the tires. This prevents the car from rolling away while it is being fixed.

**Wheel and Axle -**A wheel and axle is a large wheel attached to a smaller wheel. When the smaller wheel is turned, it causes the larger wheel(s) to also turn. A smaller cylinder shaped wheel, called the axle, connects the wheels on a car. When the axle is turned the wheels turn together, allowing the car to move forward or backward. A wheel and axle is the simple machine at work in steering wheels, doorknobs, windmills, and bicycle wheels. Not only is a wheel and axle found on the wheels of a car, but it is also found in the steering wheel.

**Screw -**A screw is an inclined planed wrapped around a cylinder. We see screws every time we open a bottle of juice. Take a look at the top; can you see the inclined plane wrapped around the cylinder? Screws help to fasten things. Screws are the simple machine seen on gas caps, the bottom of light blubs, and spiral staircases. Screws are part of the bolts that hold the wheels onto the rest of the car, as well as hold together many other parts of the vehicle.

The world around us is filled with simple machines. They help us to do a lot of work with less force. The next time you may be struggling to do something, such as moving that box from the truck to the ground, think of which simple machine to use to make the work easier!























