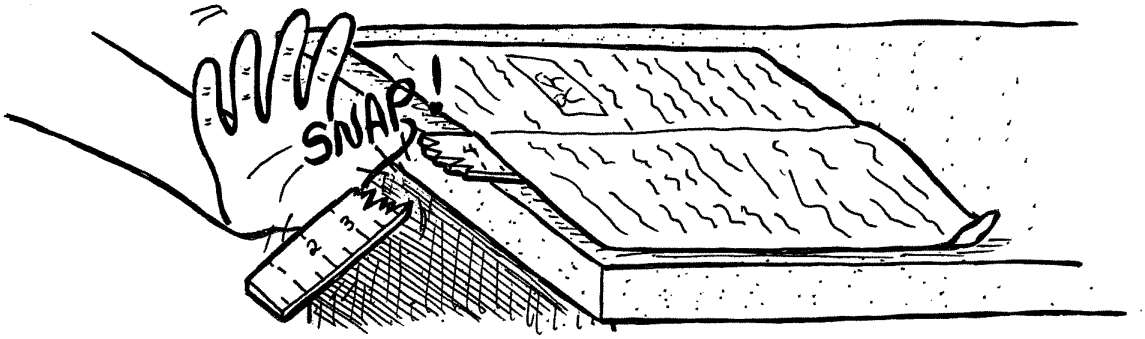
- A second demonstration (that does not involve fire), lets the teacher show off Ninja/karate skills by snapping a ruler over the corner of a desk. The force of the air presses down on the newspaper allowing the ruler to be broken. (Use a non-metal ruler for this demo.)

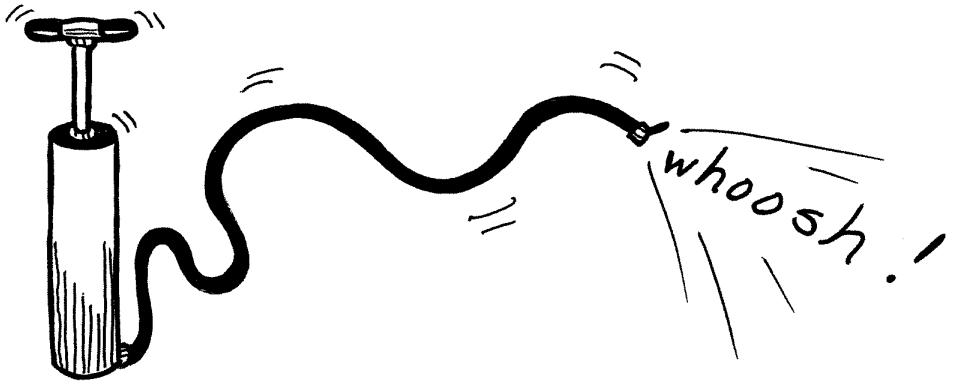


- Commence with the notes on air pressure, stressing how air pressure is really like a column of air as high as the sky, pressing downwards. (The increase in water pressure felt by a swimmer as they dive deeper in a swimming pool is very similar to the effect of air pressure - except with a column of water instead of air.)

- Hand out the related worksheet, "**Gravity Force And Air Pressure**", in which students individually or in pairs answer a series of problems.

Answers

1. Gravity force (force of gravity), force of air pressure (air pressure), friction force, magnetic force
2. Jupiter has a much larger mass than Earth so it has a larger force of gravity than the Earth. (In fact, the gravitation pull on Jupiter is 319 times greater than on Earth, making a person feel the same as after a whole day of Christmas feasting!)
3. 9.8 x 3 = 29.4 Newtons (The force of gravity is 29.4 Newtons.)
4. 9.8 x 45 = 441 Newtons (The force of gravity acting on the student is 441 Newtons.)
5. Because the moon has only one sixth the mass of the earth, it has only one sixth the force of gravity of the Earth. Since the force of gravity is smaller, people can jump much higher than on Earth.
6. "g" forces slam the bodies of pilots and race car drivers against their restraints making movement difficult. Excessive "g" forces also make it harder for the body to circulate blood properly, sometimes leading to lightheadedness or even blackouts.
7. The higher up in the atmosphere a person goes, the less air is "piled" on top of a person resulting in a decrease in air pressure at high altitude. This decreased air pressure at altitude is the reason that bread will rise faster and water will boil sooner at high altitude.)
8. Some possible uses could include being used to : drive nails, operate wrenches, hoist cars, clean things, pump up tires or basketballs, run a jackhammer, power rock-cutting drills in mining, etc.



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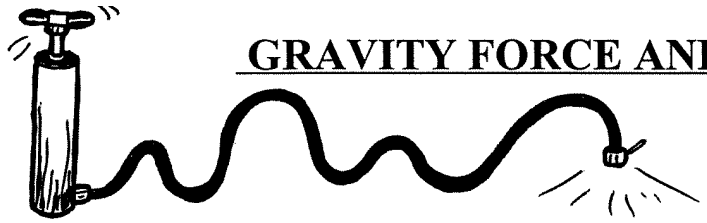


GRAVITY FORCE AND AIR PRESSURE

NAME: _____

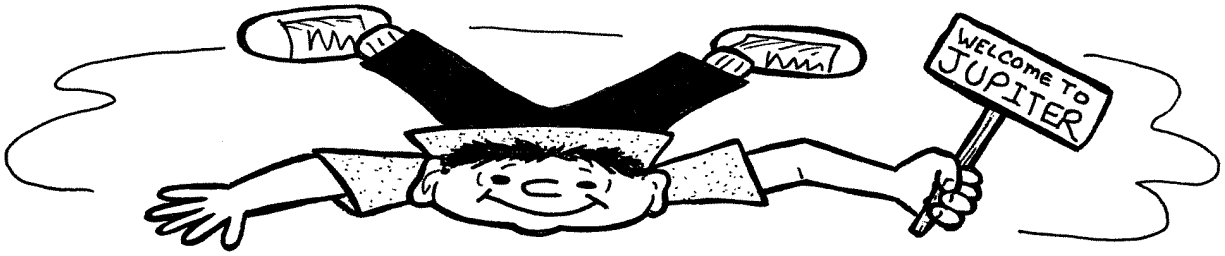
Instructions: Complete the following problems being sure to show your work. (Answer In Full Sentences where possible - A.I.F.S.)

1. **List four types of forces.**

   a) _____ **b)** _____

   c) _____ **d)** _____

2. **Why is the force of gravity on Jupiter much higher than on earth? (A.I.F.S.)**



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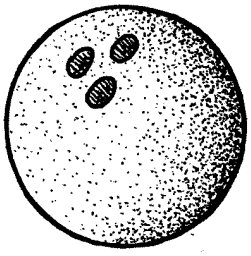
3. **What is the force of gravity (in Newtons) of a bowling ball that has a mass of 3kg?**



4. **What is the gravity force on a student with a mass of 45kg?**

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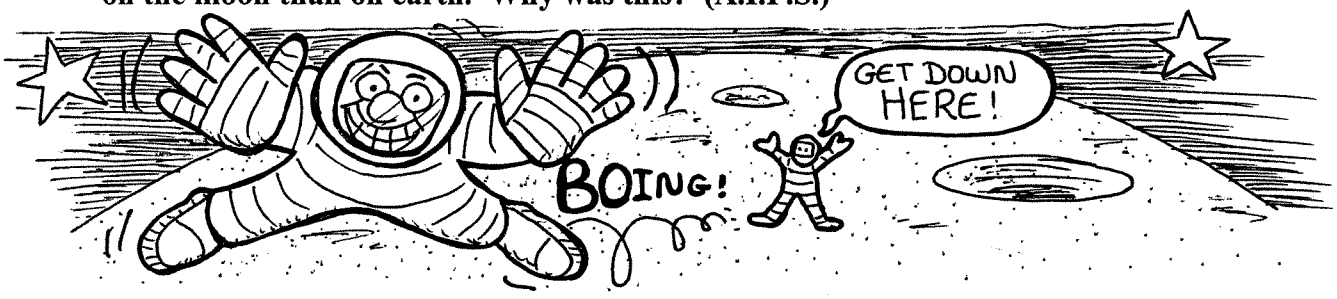
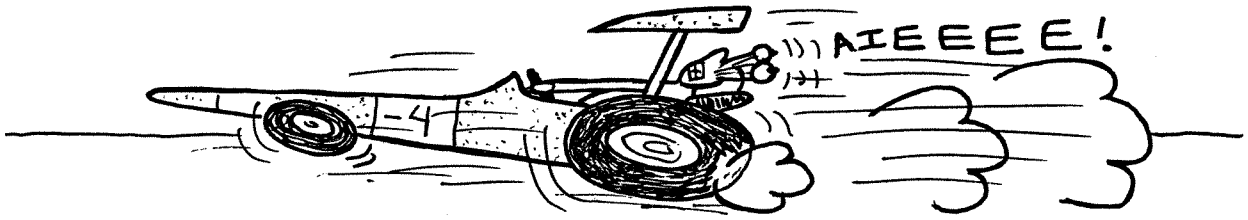
5. **When astronauts first landed on the moon, they discovered that they could jump higher on the moon than on earth. Why was this? (A.I.F.S.)**



6. **Race car drivers and pilots can experience increased gravity forces when they make high-speed turns, called "g" forces, making them feel three or four times heavier than they really are. (These are the same sorts of forces you may feel in a fast- moving amusement park ride such as a roller coaster - except many times stronger.) What sorts of problems do you think "g" forces might create for pilots or race car drivers? (A.I.F.S.)**



7. **Why is the air pressure less on top of a high mountain? (A.I.F.S.).**

8. **List four uses of air pressure.**

a) _____ **b)** _____

c) _____ **d)** _____

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