

BACKGROUND

Oil and gas separation technology makes use of density and buoyancy properties of materials. As the pressure declines in a reservoir, a gas cap is created.

This activity demonstrates that compressing material increases the material's density. Increasing the density then causes the "diver" to sink when it becomes more dense than the surrounding water. Releasing the pressure then causes the diver to float again.

QUESTION

How does density and buoyancy change with increased pressure?

MATERIALS

- Large paper clips (The vinyl covered multi-colored ones work best)
- Small rubber bands
- A clear two-liter soda bottle with lid
- Clear plastic straws

INSTRUCTIONS



1. Fold straw in half and pinch it in the middle to make it easier to bend. Wrap a rubber band several times around the bottom to secure the ends. To add weight to the diver, hook the outside ends of both large paper clips on the rubber band between the front and back of the straw, placing one paper clip on each side of the diver.
2. Fill the bottle with water, put the diver in, and twist the cap on. It is best to avoid extremes in water temperature.
3. Squeeze the bottle to make the Cartesian diver sink, and release to make it rise. Vary how hard you squeeze the bottle. You will find that the harder you squeeze, the faster the diver will sink to the bottom.

CONCLUSIONS

1. What happens to the volume of air in a Cartesian Diver? _____

2. What happens to the diver when the pressure is decreased from the bottle? _____
