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May 2020

Week 7 #SolveItWithSTEM@Home Experiment Pack for Secondary Schools *featuring Alice and Eddie - our STEM Gurus*



Hey everybody! Seems like yesterday we were sending out the first STEM pack...we are now on Week 7!

Eddie and I hope you are all enjoying the various experiments each week and finding time to explore the different STEM subjects.

This week we have two experiments involving a glass... find out on pages 3 and 5.

Another maths question is available on page 6 and the answer to Week 6 is on page 7.

Have a great week and take care!

Reminder: Make sure you do the experiment safely and with an adult present!



Experiment #11: Floating Egg

(Make sure you have an adult help you with this experiment)

Items Required:

- One egg (make sure it is in date)
- Water
- Salt (1 to 2 cups)
- A tall drinking glass
- A spoon

Instructions:

- Pour water into the glass until it is about half full.
- Place an egg in the glass of water and see if it sinks or floats (it should sink).
- Stir in 1 tablespoon of salt and keep stirring until the salt dissolves. Keep adding more salt until the egg floats.
- Next, carefully pour more fresh water until the glass is nearly full (be careful to not disturb or mix the salty water with the plain water). If you're very careful, you can get the egg to float between the fresh and salt water!



How does it work?...

The egg is denser than the fresh water (more molecules per square inch), this causes it to sink. When you start dissolving salt in the water, this is increasing the density of the water (adding more molecules per square inch). Eventually the water becomes denser than the egg causing the egg to float. When you carefully add fresh water again, this fresh water is less dense than the salt water so it floats right on top!

This extract is taken from the [sciencefun.org website](http://sciencefun.org), visit the link to find out more!



Experiment #12: Invisible Extinguisher

(Make sure you have an adult help you with this experiment)

Items Required:

- Tall drinking glass (or approx. 16 oz plastic cup)
- Short drinking glass (or approx. 9 oz plastic cup)
- Tea light
- Matches or a lighter
- Baking soda
- Vinegar



Instructions:

- Place the tea light in the short drinking glass.
- **Ensure an adult completes this part** - using a long match or lighter, light the tea light and leave it within the glass.
- In the tall glass, pour approx. 8oz of vinegar.
- Slowly sprinkle ½ tsp of baking soda into the tall glass containing the vinegar. You can pour it in all at once... there will be a reaction. Let this settle and the foam to disappear.
- Hold the tall glass and slowly tilt it towards the tea light but don't pour the liquid in.
- The flame should disappear!

If it doesn't work on your first try, pour slightly more baking soda into the vinegar and try again.

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How does it work?...

The baking soda/vinegar reaction results in a gas called **Carbon Dioxide** (CO_2). CO_2 is more dense than normal air, which means that it will sink! Because CO_2 sinks, it stays in the cup instead of floating away like a normal mix of air would.

This means you have a cup full of CO_2 !

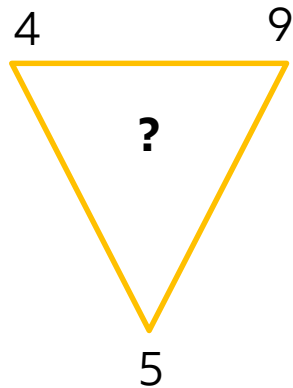
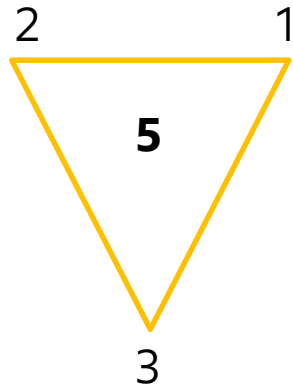
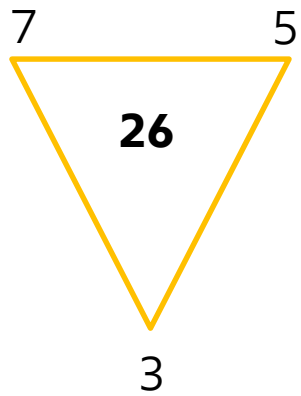
The candle burns thanks to a combustion reaction that requires **Oxygen** (O_2), something we find in abundance in the air around us. When you tilt your cup of CO_2 into the cup containing the candle, the CO_2 sinks to the bottom of the cup and surrounds the candle. This displaces (or pushes up) all the normal air including the O_2 which the fire needs to keep burning. And Voila! Your candle is extinguished invisibly!

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Week 7 – Maths Question!

What is the missing number in triangle four?



Why not give this maths question a go...

The correct answer will be included within next week's pack...stay tuned!



Week 6 – Maths Question Answer!

Tom asked his Granny how old she was. Rather than giving him a straight answer, she replied:

"I have 6 children, and there are 4 years between each one and the next. I had my first child (your Uncle Peter) when I was 19. Now the youngest one (Your Auntie Jane) is 19 herself. That's all I'm telling you!"

How old is Tom's Granny?

Tom's Granny is 58 years old. Let's see why:

First child born: Granny is 19
Second child born: Granny is 23 ($19 + 4$)
Third child born: Granny is 27 ($23 + 4$)
Fourth child born: Granny is 31 ($27 + 4$)
Fifth child born: Granny is 35 ($31 + 4$)
Sixth child born: Granny is 39 ($35 + 4$)
Sixth child is 19: Granny is 58 ($39 + 19$)



We hope you enjoyed the Week 7 activities.

Week 8 will be coming soon.

Best wishes

The ExxonMobil Fawley #SolveItWithSTEM Team!