John Tyndall Science Experiment!

The Activity:
Carry out the Tyndall Challenges.

Activity Type:
Patrol Activity
Troop Activity

Roles:
Activity Leaders

The Crean Award:

Discovery:
Patrol Activity
Skills

Terra Nova:
Task/Role in Patrol
Patrol Activity
Skills

Endurance:
Planning
Develop Teamwork

Polar:
Patrol Activity

SPICES
Intellectual
Social

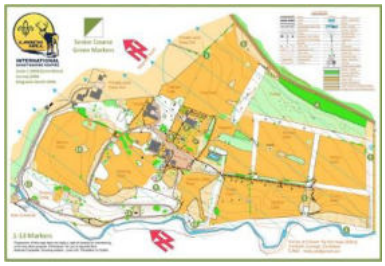
Plan:

Tyndall

John Tyndall (1820-1893) is a famous Irish Physicist who was born in Leighlinbridge, Co. Carlow. Tyndall's scientific breakthrough came with a paper that identified the critical role of Greenhouse gases (GHGs) in maintaining the earth's temperature. This was hugely significant at the time and, as our understanding of climate change has improved, Tyndall's papers & experiments has been at the source of this. His work was especially important as he was able to demonstrate this phenomena as opposed to theorising.

Tyndall became part of the golden age of British mountaineering. Initially he went to the Alps for scientific research but became an enthusiastic and competent mountaineer. He was a member of the first group to climb the Weisshorn and lead one of the early summits of the Matterhorn.

Do:



Orienteering:

This challenge will start with an orienteering /navigation course to represent his outdoor work & hobbies in both ordnance survey and the mountains. The leader/other patrol need to lay a course with the caches marked on the map. If you are in an area with little outdoor space they can be exact bearings and pacings to find a very small target. Each cache should be found in order and the cache can either be a part of a code word that needs to be strung together or a portion of the experiment's equipment (see below).

Equipment: Compass (per patrol), caches/code word in pieces. Map or bearings/pacing

Magnetic Slime

Tyndall's initial work was on Magnetism so we will do an experiment to create magnetic slime.

Equipment:

- 235 ml (8oz) White school glue
- Borax (laundry section of a grocery store)
- Large mixing bowl
- 265 ml (9oz) Plastic cup
- Measuring cups and spoons
- Zipper-lock plastic bag
- Iron filings
- Neodymium magnet
- Water
- Spoon
- Dinner plate

Photo and modified instructions from:
stevespanglerscience.com/lab/experiments/magnetic-slime/

Instructions:

- Empty the entire bottle of white school glue into the large mixing bowl
- Fill the empty bottle nearly full with water, cap it, and shake it up to recover all the glue.
- Pour the water and glue solution into the bowl.
- Add a generous amount of iron filings to the water and glue mixture. Stir the new mixture thoroughly with a spoon.
- Measure a 1/2 cup (118 ml) of warm water and pour it into the plastic cup.
- Add 1 teaspoon of borax powder to the water in the cup and stir the solution. Be sure the borax dissolves completely.
- Add the borax solution to the glue solution in the bowl.
- Mix the glue and borax solutions together completely. It's a totally safe combination so use your fingers but be sure to wash your hands with soap first. There's no point loading your new slime with dirt from your hands. It may take a few minutes to get all of it to mix but it will come together. When the chemistry has done its job, you'll be holding a large blob of a familiar looking toy. Lay the putty-like mass on the plate and flatten the goo so it has a smooth surface.
- Bring the magnet close to the surface of the flattened slime and watch the slime spring upward and grab it. The slime is stretchy but it doesn't want to move easily out of place. Use the magnet to build miniature volcanoes in the slime. If the slime is clean (because you made it with clean hands) then store it in the zipper-lock bag in the fridge. When you've made all the discoveries you want with it, you can toss it – bag and all – in the trash.

Patrol Review

Did your experiment work?

Did you have any difficulties?

Did everyone take part?

What SPICES are relevant?
Check them off on the next page

Review SPICES

Social
- Relationships ☐
- Communication Skills ☐
- Other Cultures ☐
- Community Involvement ☐
- Promise and Law ☐

Physical
- Eat Well ☐
- Personal Hyigene ☐
- Balanced Lifestyle ☐
- How the Body Works ☐
- Physical Limitations ☐
- Health Choices ☐
- Access Help ☐

Intellectual
- Achieving Goals ☐
- New Ideas ☐
- Develop Creativity ☐
- Learn from Discussions ☐
- Team Member ☐

Character
- Promise and Law ☐
- Friends and Friendships ☐
- Plan before do ☐
- Ensuring Fairness ☐
- Respect ☐
- Differences and Views ☐
- Following Dreams ☐
- Live the Scouting Spirit ☐

Emotional
- Aware of Feelings ☐
- Asking/Giving Help ☐
- Responsibility for Emotions ☐
- Controlling Emotions ☐
- Going Further ☐
- Beliefs and Values ☐
- Developing Talents ☐

Spiritual
- Promise and Law ☐
- Impact on the Environment ☐
- Reflection ☐
- Changing Beliefs ☐