APEGBC 2016 Science Games

Division 1 Take Home Activity: Jurassic BC

Saturday, March 5, 2016 | 8:30am - 12:30pm | Science World at TELUS World of Science

Coal is an important resource for BC. It is the remains of ancient plants that grew millions of years ago. Some of the coal came from the Jurassic period, roughly 100 million years ago. The Jurassic is of course also known for dinosaurs. In BC (Tumbler Ridge) coal and dinosaurs are even found together, particularly with fossils of the footprints of dinosaurs that once walked along sandy river banks.

In this activity, teams will have to work together to create a diorama of the Jurassic environments that created BC's coal beds.

Instructions:

Step 1: Research! What type of environment was the coal formed in? What was the climate like in BC during the Jurassic period? How did the coal form? Make sure to create a list of your sources.

Step 2: Create your team diorama! Don't forget to label your diorama to explain its contents. What plants or animals are there? Make sure it meets all of the criteria listed in the rules section.

Step 3: Bring your diorama and source list to the Science Games for judging.

Step 4: Be prepared to explain your diorama as a group to the Science Games judges. What did you find out through your research? How does coal form? How did you decide what to include in your diorama?

Rules:

1. Materials used to create your diorama must be available for purchase at a Dollarstore or no cost (e.g., items from your recycling bin or old toys).
2. Dioramas must be primarily created by the students (adult help is permitted where appropriate, e.g. use of hot glue guns)
3. Diorama must be no bigger than 45 cm x 45 cm x 45 cm.
4. Your diorama must be 3D. Judges should be able to see at least one full side of the diorama (not including the view from the top).
5. Dioramas must show what kind of environment coal forms in. For example, does coal form in a desert, river, swamp, or mountainous environment?
6. Dioramas must be labelled in some way to explain what content is being shown.
7. Dioramas must explain or illustrate what the climate was, for example, warm and wet, or cold and dry.
8. Dioramas may include dinosaurs.
9. Team must list their information sources in their source list.
10. Your source list must include name of the website and link or the name of the book and author.

Getting Started:

Here are some useful sources of information on the Jurassic. To impress our judges, make sure to expand your information source list from the exaples below.

- http://www.fplsafetyworld.com/?ver=kkblue&utilid=fplforkids&id=16200
- https://www.youtube.com/watch?v=BQ_Ethb6_Wk
- http://nationalminingmuseum.com/kids-zone/fossil-fuel-formation-vimeo/
- http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/energy_transfer_storage/revision/6/

Contact Information:

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Division 1 Mystery Activity: Sailboat Race

Saturday, March 5, 2016 | 8:30am - 12:30pm | Science World at TELUS World of Science

It's a race to the finish! In this event each team will need to work together to create a sailboat out of the materials provided. After building your team's sailboat you'll enter the Science Games Sailboat Race and see whose boat is the fastest.

Instructions:

Step 1: Decide what materials you will use in your Sailboat. What can you use as a sail? What can you use as the base of the boat? Don't forget, your boat needs to be able to float and to fit in the Sailboat Race Lane.

Step 2: Build your sailboat.

Step 3: Test your sailboat. Does it sail when propelled by air through a straw? Is it light enough?

Step 4: Make adjustments to your design so that your sailboat is even faster.

Step 5: Race your sailboat against other teams.

Rules:

- Teams can only use the materials provided to create their sailboats.
- Sailboats can only be propelled by air blown through a straw.
- Straws cannot be used to build your boat. They should only be used to propel your boat during the race.
- During the race:
  - Teams can only use air from the straw to move the boat.
  - Your team members cannot interfere with other boats.

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Division 1 Mystery Activity: Clean Water

Saturday, March 5, 2016 | 8:30 am – 12:30 pm | Science World at TELUS World of Science

Water is a resource we use every day. Living in Canada, it is easy to get clean water out of your tap but it doesn't always start out that way. The water in your tap goes through a complex filtration process to make sure it's clean enough for you to drink.

Today you'll need to think like an engineer and create a water filtration system that can clean this container of water.

Instructions:

1. As a team, create a plan for your filtration system. Look at the dirty water. What items are you trying to remove from the dirty water? What items will you use as a part of your filter? How will you put together your filter?
2. Build your filter. Work as a team to create your filter. Make sure to have your team name shown on your filtered water container.
3. Filter your water sample. When you are finished building your filter, call over your adult team leader and one of the judges to filter your water sample. Adult team leaders will time how long it takes for your water sample to filter. How long did the filtering take? What items were removed? How do you think your filter could improve?
4. Modify your filter. When you are finished modifying your filter, call over your adult team leader and one of the judges to filter your water sample again. Adult team leaders will time and record how long it takes for your water sample to filter.
5. See your final results. What items was your filter able to remove? What items made it through your filter?

Rules:

1. Teams must use the pop bottle for their filter.
2. Teams will be given materials to make their filter. Teams may use as much or as little of these materials in their filter as they wish. Teams will not be given more material.
3. Teams need to have their team name shown on their filter.
4. Both filtrations will be timed but only the second one will be recorded.
5. Be careful not to spill your water sample.
6. Teams must keep their work stations as clean as possible.

APEGBC 2016 Science Games

Division 2 Take Home Activity: Geo Destruction!

Saturday, March 5, 2016 | 12:45pm - 4:45pm | Science World at TELUS World of Science

Earthquakes, volcanoes and landslides, oh my! The earth can be a dangerous and destructive place. Some of the most dangerous hazards, such as volcanoes and earthquakes, often occur in the same areas. This is because these hazards are all tied to the earth and its geography. These hazards are called geological hazards or geohazards.

Geoscientists, or earth scientists, study geological hazards. Their work is very important because they help people understand what hazards may be present in or around a town based on the geography of the area. For this Take Home Activity your group will act like geoscientists and research a geological hazard from BC.

Instructions:

Step 1: Pick one geohazard to investigate out of the following list:

- Earthquakes
- Tsunamis
- Volcanoes
- Landslides
- Naturally occurring poisons (for example, Mercury, Uranium, Asbestos)

Step 2: Research your geohazard. Don't forget to cite your sources!

- Include the names and links to any websites you use in your research.
- Include any book titles and authors for any books you use in your research.

Step 3: Create a diorama or other visual demonstration (e.g., 3D puzzle, model, etc.) of your geohazard.

Step 4: Create a 1 page paper with the following information:

1. Describe the geohazard and how it impacts people's lives.
2. Describe what geoscientists and/or engineers study to learn more or reduce the effects of this hazard on people who live and work in BC.

   For example:

   - Is it possible to set up warning systems for this hazard?
   - Are there specific indicators in the geology of an area that can help geoscientists understand where a geohazard may occur?
   - Are there specific indicators which help geoscientists understand why or how often a geohazard may occur?
   - Is it possible to design buildings and other infrastructure to better withstand a geohazard?
3. Hypothesize what new techniques scientists could come up with in the future to better predict or reduce the effects of these hazards. Some examples might be:
   - predict geological hazards like earthquakes or volcanic eruptions before they occur
   - release seismic forces by triggering 10,000 small earthquakes before one large earthquake
   - engineer buildings in a way so that they are not affected by earthquakes.

Step 5: Be prepared to talk to Science Games judges at the event about your group's chosen geohazard, your visual demonstration of the geohazard and your team paper.

Rules:

1. Teams must bring their research paper and visual demonstration to the Science Games.
2. Your team's visual demonstration must fit within a 1m x 1m x 1m space.
3. All supplies used in your team's visual demonstration should be available from a dollar store.
4. All sources used in your team's research should be cited in a bibliography.
5. All work on your visual demonstration and research paper should be done by student team members. Adult assistance should only be used if there are safety concerns (e.g., using a hot glue gun).
6. All visual demonstrations of hazards must not actually be hazardous to volunteers, participants or activity judges.

Please note: This activity will be judged outside. All visual demonstrations should be able to withstand outdoor elements, such as rain or wind.

Contact Information:

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Professional Engineers and Geoscientists of BC

APEGBC 2016 Science Games

Division 2 Mystery Activity: Colour Coding

Saturday, March 5, 2016 | 12:45 – 4:45 pm | Science World at TELUS World of Science

Rules:

1. Team members are only allowed to use five instructions: move one square up, move one square down, move one square left, move one square right and fill in the square.
2. Teams can only provide instructions to move or fill in one square at a time.
3. Groups cannot use loops. For example, groups cannot say “Repeat step one five times.” Groups cannot give descriptive instruction such as “fill in top left corner.”
4. Teams do not have to do the patterns in order. For example, teams can work on the harder patterns before the easier ones.
5. Groups will have a limited amount of time to work out the instructions of the patterns.
6. Patterns will be disqualified if teams do not use the instructions in rule 1.
7. All pattern instructions should be written down.
8. Each pattern sheet should state the name/ number of the pattern.
9. Each team must make at least one original pattern to be replicated.
10. Once the Practice Round is over, team members will only be able to speak to members of their group on the same side of the partition wall (e.g. Red Group members can only speak to other member in the Red Group). The only form of communication between the Red and Blue Groups will be by the instruction sheets.
11. Teams will continue making instructions and patterns until time runs out. Teams can choose to create their own patterns to complete at any point during the activity.

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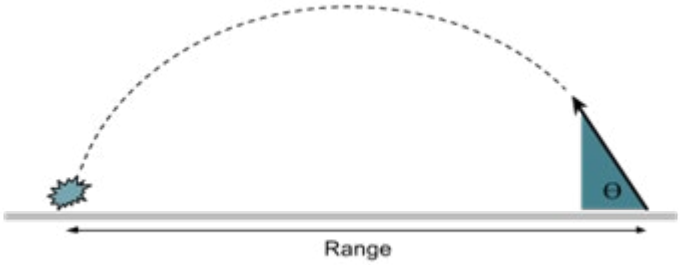
Division 2 Mystery Activity: Blast Off!

Saturday, March 5, 2016 | 12:45 pm – 4:45 pm | Science World at TELUS World of Science

For decades, engineers and other scientists have been finding ways to defy gravity and send things into space. They must use their scientific knowledge to assess how to best design a rocket.

In this activity, teams will have to think like an engineer to construct a pair of paper rockets. Your goal will be to create a rocket that will travel the furthest when launched using the APEGBC Rocket Launcher.



Each team will have 25 minutes to design and construct their two rockets based on the round tube provided as the body. Both of the rockets will be launched and the furthest distance travelled by the two will be recorded. Teams must use the pop bottle for their filter.

While designing and constructing your rockets consider the following questions:

- How many fins does a rocket need to stabilize it?
- How does the weight of a rocket affect it?
- How can fins stabilize the rocket? How can weight stabilize the rocket?
- Are rocket fins necessary in outer space?

Points are awarded based on the rocket that travels the furthest horizontal distance. Make sure your rocket body fits snugly over the provided test launch tube.

Rules:

1. All rockets must clearly display the team name.
2. Do not build your rocket past the marked line on the launch tubes.
3. Teams and spectators must listen to Science Games judges/volunteers when outside in the launch area. Your team may be disqualified if you do not listen.