



Division 1 Take Home Activity: Build-a-Bird House

Saturday, March 1, 2014 | 8:30am - 12:30pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

For the first part of this activity, teams will make a bird house using household materials. Each team will pick a bird native to BC and build that bird a house. Once your team has chosen their bird they will need to do some research. Where does your bird live? What does it eat? What materials will you use to build your bird house?

These are all things that you will need to state in the second part of this activity, the design paper. The design paper should show the reasoning behind your team's design decisions. Don't forget to cite your sources here!

On the day of the Science Games, teams will bring their bird houses and design paper for judging. Judges will be administering points based on the design paper content and creativity as well as the created bird house and teamwork.

You can prepare for the Science Games by being able to answer a few questions about your bird house design including:

- Why do birds need shelter?
- How can you attract birds to use your birdhouse?
- Does your bird live near water?
- Can other animals such as squirrels get into the feeder?

**Please note: judges will also ask other questions about your team's bird house*

Contact Information

Please direct any questions about this activity to:

Chelsea Smith, Communications Coordinator
APEGBC

Direct: 604-412-4892 | Toll Free: 1-888-430-8085 ext. 4892

Email: csmith@apeg.bc.ca

Rules

1. No kits or pre made designs.
2. Design paper should be the size of a standard sheet of paper (8.5x11 in).
3. The design paper should state the type of bird, location of where it lives in nature, what it eats, materials used in the bird house, list of technical sources & your team name.
4. **Teams must email the bird type which they have chosen to csmith@apeg.bc.ca by Feb. 14, 2014.**
5. The bird house must fit in a 15in x 15in x 15in sized box.
6. Bird houses should be designed for a bird native to British Columbia.
7. Teams must bring their bird house and design paper to the Science Games to participate!

Coach Tip

Encourage students to research their bird before beginning to build the bird house and to be creative with the design paper.



Professional Engineers
and Geoscientists of BC



Division 1: Race Through a Sloped Course

Saturday, March 1, 2014 | 8:30am - 12:30pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

- It's a race to the finish!
- Teams will work together to create a course for a ball to travel through.
- The goal is to create the fastest course on the sloped platform using the materials provided.
- Each platform contains 18 fixed points, including Start and Finish points. These points cannot be removed or relocated.
- To set up your course, you will create routes between these fixed points, using the twine, elastic bands and/or pipe cleaners provided. All fixed points must be connected.
- A route is a path connecting two fixed points. Your ball must pass through all the routes but does not need to travel the full distance of the routes.
- Each team will be given a maximum of 3 opportunities to record a time for their course. Only the best time out of the three will be counted.
- During the building phase team leaders can assist their teams by timing their course. When your team is ready bring over a judge to record your time.
- Teams will be given points based on the length of time it takes for their ping pong ball to travel through the course passing through all the routes and the materials they use, as well as teamwork and creativity.

Rules:

- All fixed points must be connected.
- The ball must pass through all of the routes but does not need to travel through the full distance of the routes.
- Teams can modify the materials used to build the course (ie. twine, elastic bands, pipe cleaners), but cannot change the slope platform nor move or remove the fixed points.

Materials

Volunteers please check the list below to ensure you have all the materials you need to conduct the activity.

Materials to judge/run activity

Item	Quantity
Stop watch	8
Sloped Surface	16
Safety scissors	16
Fixed Points	18

Materials per kit (team)

Item	Quantity
Red Plastic Ball	1
Twine (4m in length)	15
Elastic bands (various)	40
Pipe cleaners	20

Activity Schedule

Instructions - 5 minutes

Building/Testing - 40 minutes

*Teams may ask judges to time their course after 15 minutes have passed during the building phase

Judging - 15 minutes



Professional Engineers
and Geoscientists of BC



Division 1: Radioactive Recovery

Saturday, March 1, 2014 | 8:30am - 12:30pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

- Disposing of hazardous waste is a real challenge.
- In this activity team members will work together to create tools which they can use to safely move materials from the nuclear plant on one side of the room to the disposal site on the other.
- The nuclear plant is filled with ping pong balls. These are the radioactive materials which you need to safely transfer to the disposal site.
- Teams will have 30 minutes to create tools which can safely pick up the radioactive material and transfer them to the disposal site.
- Each team will be given one practice ping pong ball so that they can test and improve their tools.
- Each team will be given two chances to record a score for their team after the 30 minute building time is over.
- A "Contamination Leak" occurs if a team member touches or drops a ping pong ball during the transportation period.
The contaminated material would then be returned to the nuclear plant. The team member who dropped/touched the radioactive material would then go back to the disposal site and start their turn over.
- The team who safely moves the most radioactive materials the fastest will receive the most points in this activity.
- Points will also be given based on creativity, teamwork, and use of materials.

Rules:

- Teams can only use the items provided to create their tools
- Each tool you create can only be used once to transfer a ping pong ball and then it is contaminated and cannot be used again.
- Teams cannot touch the ping pong balls or touch/tip/move the paper bags
- Team members must rotate through transporting the radioactive materials during the timing period.

Materials

Volunteers please check the list below to ensure you have all the materials you need to conduct the activity.

Materials to judge/run activity

Item	Quantity
Stop watch	8
Signs (Disposal site, Nuclear Plant)	8 of each

Materials per kit (team)

Item	Quantity
Ping Pong balls	6
Paper clips	2
Straws	3
3in x 3in pieces of paper	4
Elastic bands	5
Popsicle sticks	6
Push pins	7
Plastic spoons	8
6in pieces of string	9
Roll of tape	1
Pipe cleaners	4

Activity Schedule

Instructions - 5 minutes
Building time - 30 minutes
Transportation of Materials - 20 minutes
Judging - 10 minutes



Professional Engineers
and Geoscientists of BC



Division 2 Take Home Activity: Treasure Collector

Saturday, March 1, 2014 | 12:45am - 4:45pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

Students will create their own treasure hook collector. Teams will be provided with a materials kit at the end of January.

Using these materials students will work together to build a treasure hook collector which is able to pick up butterfly clips of various sizes. At the Science Games the butterfly clips will be placed standing upright with both handles together and positioned straight up. Your treasure hook collector should slide back and forth on a string so that you will be able to use it to pick up these treasures across an approximately 2ft x 16ft span.

At the Science Games team members will stand on either side of the treasure area (approx. 16 ft apart) which is scattered with loot. Using your treasure hook collector your team will need to pick up and guide the most treasure out of this area to a member of your team.

Judges will be administering points based on how many pieces of treasure your team is able to collect within a limited amount of time, as well as teamwork, creative use of materials and design.

Materials Provided:

Cardboard box, roll of tape, 3 paper clips, 2 pipe cleaners, 1 strip of sticky tack, 6 popsicle sticks, 5 rubber bands, 2 drinking straws, 2 pieces of string, 2 butterfly clips (aka treasure).

Contact Information

Please direct any questions about this activity to:

Chelsea Smith, Communications Coordinator

APEGBC

Direct: 604-412-4892 | Toll Free: 1-888-430-8085 ext. 4892

Email: csmith@apeg.bc.ca

Rules

1. Use only the materials provided to create a treasure hook collector.
2. Teams do not have to use all of the items in the kit.
3. Your team name must be listed on your treasure hook collector.
4. Teams can use scissors to modify the materials provided.
5. All team members must know how to use the treasure hook collector.
6. Team members will not be allowed to enter the treasure area during the activity.
7. Butterfly clips are to be used for testing only and should not be incorporated into the design of your treasure hook.
8. Teams must bring their treasure hook collector to the Science Games to participate.

Coach Tip

Teams may use the box as well as the items which were sent in the box to create their treasure hook collector.



Professional Engineers
and Geoscientists of BC



Division 2 Activity: Slo-Mo Plinko

Saturday, March 1, 2014 | 12:45pm - 4:45pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

- How slow can it go? You decide! Team members will create a course for a ping pong ball to travel through.
- The course that your team creates can start and finish at any point on the board. Once the ping pong ball is set in motion, it must maneuver through the entire course without any assistance from team members and without stopping.
- Each team will have 3 chances to record a time for your course.
- The first opportunity to time your team's course will be 15 minutes into the activity.
- After the first timed recording of your course is complete work to improve your design and lengthen the time it takes for the ping pong ball to navigate through your course.
- After the first drop teams can call over a judge to score their design for a 2nd and 3rd time as needed.
- The team which records the longest time will receive the most points for this activity.
- Teams will also receive points based on creativity, teamwork and innovation.

Judging Notes

Longest Fall = 20 points 4th Longest = 13 points
2nd Longest = 17 points 5th Longest = 10 Points
3rd Longest = 15 points Successful falls = 5 points

Innovation:

Did they create something different for each tested course?

3 Very different courses/improvements - 10 points

2 Different courses/improvements - 6 points

1 Different course/improvements - 4 points

No changes between courses/improvements - 0 points

Activity Schedule

Instructions - 5 minutes

1st Building Segment - 10 minutes

1st Try - 15 minute mark

Building & Testing Segment - 20 minutes

Final Judging - 10 minutes

Materials

Volunteers please check the list below to ensure you have all the materials you need to conduct the activity.

Materials to judge/run activity

Item	Quantity
Plinko Board	8
Plinko Support for Board	8
Stop watch (1 per judge)	8 (est.)

Materials per kit (team)

Item	Quantity
Elastic bands (regular)	150
Elastic Bands (thick)	50
Wooden Dowels	42

Rules:

- The ping pong ball may be dropped/ placed anywhere on the board.
- The ping pong ball must continue to move throughout the course. It cannot stop.
- Only rubber bands and dowels can be used to construct the system and constrain the ball.
- Each team is given three official attempts. The longest time is scored.



Professional Engineers
and Geoscientists of BC



Division 2 Activity: Protect Your Melon

Saturday, March 1, 2014 | 12:45pm - 4:45pm | H.R. MacMillan Space Centre & Museum of Vancouver

Instructions:

- How can you protect your melon? Teams will work together to create a helmet for their cantaloupe which will best protect it from cracking when dropped from various heights.
- As an engineer you have to select the best materials to use in a project but also balance that with staying cost effective. Each team will need to choose what materials to purchase to create your helmet.
- You will have a total of two opportunities to buy materials however the cost for each item is doubled on the second purchase order.
- Once teams have their materials they can start building.
- Teams can ask a volunteer to purchase more materials at any time during the construction period.
- At the end of the building period we will head outside together to the drop zone as a group.
- Teams will be able to draw a face on their melon only after finishing construction of their helmet.
- The team who's melon is dropped from the highest height without cracking will receive the most points.
- Points will also be awarded based on the cost of your materials, teamwork and creativity.

Rules:

- No cutting or breaking the skin of the cantelope during the construction phase.
- Teams cannot return any materials once they have been purchased.
- Each item available for purchase has a limit. Teams cannot buy in excess of this amount.
- No masking tape directly on the melon.
- Rubberbands can directly touch the melon.
- The melon must be free-falling and not attached to any ropes or parachutes during the drop.
- The melon's face must be kept uncovered at all times so that the melon can see, breathe and speak.
- Face painting must be done at the end of helmet construction.

Materials

Volunteers please check the list below to ensure you have all the materials you need to conduct the activity.

Materials to judge/run activity

Item	Quantity
Purchase order form (per team)	16
Cantaloupe	16

Materials available to purchase

Item	*Qty	Cost	*Limit
Masking Tape	1	\$30	1
Bubble Wrap (12 x12in)	1	\$10	2
Balloons (misc sizes)	6	\$8	2
Cardboard (12 x 12in)	1	\$8	2
Styrofoam Cups (12oz)	3	\$2	2
Plastic Grocery Bags	1	\$2	2
Wooden sticks	6	\$3	3
Paper Plates (9 inches)	3	\$3	3
Bendy Straws	10	\$2	2
Rubber Bands	10	\$5	5

*Qty = Quantity per unit
* Limit = Limit per unit

Please note: the cost of these items will double for your second purchase order.

Activity Schedule

Instructions - 5 minutes
Purchase of Materials - 5 minutes
Construction Time - 25 minutes
Testing - 15 minutes (4 teams drop at once)
Judging/Interviews - 10 minutes



Professional Engineers
and Geoscientists of BC