BC SRC 2020: Explore Our Universe!

Programs - Ages 5-8, Theme 1: Up and Away! Transportation and Technology

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WELCOME

- As participants enter, have them (or their grown up) write their name on a name tag. If they’re a bit early, they can colour/decorate their name tags.
  - Name tags, Markers
  - Book for read-aloud
  - Supplies for Rube Goldberg device activity
  - Simple activities written on slips of paper, Container to draw from
  - Paper (scrap is fine), Pencils, Erasers
  - Flipchart, Marker

INTRODUCTION [2 minutes]

- Introduce self, outline the plan for the hour

ICE BREAKER [5 minutes]

- Going around a circle, have each participant say: “My name is __________ and if I could invent anything, I would invent a machine that…”

Adaptation: Ask “What’s your name?” and “What would you like to invent/make”

DISCUSSION [5 minutes]

- Who was Rube Goldberg
- Rube Goldberg comics
- What is a Rube Goldberg device

READ-ALOUD [5 minutes]

- Rube Goldberg’s Simple Normal Humdrum School Day by Jennifer George
- Just Like Rube Goldberg: The Incredible True Story of the Man Behind the Machines by Aronson, Sarah

(Or another title/article about Rube Goldberg and his wacky designs)

DISCUSS COMMON PARTS FOUND IN RUBE GOLDBERG MACHINES [8 minutes]

- Each part of a Rube Goldberg device needs to move so that it bumps, pushes, or pulls something else.
- Ramps (inclined planes) – When something rolls down a ramp, it gets energy to bump something else. This is a great way to get your machine started! For example, a marble might roll down a ramp and bump a domino over.
- Dominoes – Having dominos in a row knock each other down as they go is lots of fun.
• Pulleys – Try having a string attached between two things. When one object moves, it can move the other object that the string is attached to. For example, maybe the last domino has a string attached to it and that string is also attached to a seesaw. When the domino falls over, it pulls down the seesaw.
• See-saws (levers) – When one end of the see-saw goes down, what happens to the other end?
• Practice together: Create a simple pretend Rube Goldberg device together as a group. This will help participants understand how the parts all work together. Try drawing a sketch on a flipchart.

**ACTIVITY (3 VERSIONS) – CREATE A RUBE GOLDBERG DEVICE [15-35 minutes]**

There are three versions of this activity, in decreasing order of complexity and time. Before you begin, choose what simple action the device will do (turning on a light switch, pouring a bowl of cereal, etc.). Participants or leader can draw one from a hat (using prepared slips of paper) or participants can come up with their own.

**Using craft supplies [35 minutes]**

✓ **Materials** - General craft supplies, as well as engineering supplies such as: Marbles/ball bearings, funnels, string/ribbon, popsicle sticks, small plastic condiment cups, plastic cups, Lego, straws and/or chopsticks, cardboard, toilet paper or paper towel rolls, aluminum foil, dominoes, toy cars, corks, flexible tubing, PVC pipe, clothespins, clean contents of the recycling bin, etc.

1. Participants can work in pairs or small groups.
2. General advice:
   • Start with the task and move backwards
   • You will fail. Great ideas rarely work the first time; usually you need to change your original idea to make something work. That’s what experimenting and engineering is about!

3. Before participants can touch supplies, have them brainstorm the different parts of the device, how they will work, and how they will connect to each other. Scrap paper and pencils are great for writing/drawing ideas. Beware of participants creating devices that are too complex. Three parts is plenty for this program, especially if the participant is in kindergarten or first grade. If they really want to make something complicated, they can focus on just making a part of it during the program.

   **Alternate approach** – To make this part of the craft more accessible, have some paper and colourful pencils out as incentives to start drawing out designs.

4. After some brainstorming, participants can access supplies and start constructing, testing, and iterating.

5. ✓ **Alternate approach** - Brainstorm the device as a group and have each participant pair work on a single part. Then come back together after a while and try to connect the parts into a functioning whole.

**The Best Laid Plans [20 minutes]**

✓ **Materials** – Pencils, erasers, scrap paper, markers/pencil crayons, 11x14 paper
1. Participants can work in whatever configuration they like (solo, pairs, etc.).
2. Using the scrap paper and pencils, participants plan out their device.
3. Once they have decided on a design, they can use the nice paper to create an illustration or step-by-step description of how their device would work. It can take whatever form they like. For example, emulate a Rube Goldberg comic or use only text.
4. Optionally, they can create a supplies list for creating their invention and instructions on how to run it.

✓ Alternate approach – Provide participants with basic craft supplies to make a more decorative and/or 3D version of their device.

Live Action Edition [15 minutes]

✓ Materials – Flipchart, marker
1. As a group, participants brainstorm and then list the sequence of events/parts that will make up their device. There should roughly be the same number of parts as participants.
2. Discuss what each part would look like if a person were to act it out.
3. Assign a part to each participant (some parts might require more than one participant to act out). Further discuss how it will work. For example, how will each part activate the next part (make sure that the ‘activation’ for each part is not dangerous/hurtful or inappropriate).
4. Turn on the “machine” and watch it go!

CONCLUSION/GOODBYE

TITLES ON THEME OF BUILDING/ENGINEERING

• Douglas, You’re A Genius! by Ged Adamson
• The Patchwork Bike by Maxine Beneba Clarke
• How Things Work by Sophie Dauvois
• Weasels by Elys Dolan
• DOLL-E 1.0 by Shanda McCloskey
• Ultrabot’s First Playdate by Josh Schneider
• It’s Only Stanley by Jon Agee

ADDITIONAL ACTIVITIES

• Rube Goldberg App
  https://www.rubegoldberg.com/education/rube-works-game/
• Mousetrap Boardgame
  https://www.amazon.ca/Hasbro-Gaming-C0431-Mouse-Trap/dp/B01ISKSRK8/ref=sr_1_6?keywords=mousetrap+game&qid=1575314784&sr=8-6

RESOURCES

• Good tips about supplies and approach
  https://www.thatafterschoollife.com/rube_goldberg.html
• Rube Goldberg official website
  https://www.rubegoldberg.com/
• About Rube Goldberg
  https://www.rubegoldberg.com/the-man-behind-the-machine/
• *Joseph’s Machines YouTube Channel – video examples of Rube Goldberg machines*
  https://www.youtube.com/channel/UCbNvfx3rYYxEopnRGxfu53Q

**SAMPLE ACTIVITIES**

Turn on a light switch

Butter toast

Turn the page of a book

Crack an egg

Brush teeth

Turn off an alarm clock

Throw a ball for a dog

Water a plant

Hammer a nail
Put a bottle into a recycling bin