



STEM Career Adventures: Architect

Ice Architecture

Adventure Description

In some of the coldest parts of the world, architects use snow and ice as building materials to build homes, hotels, and event pavilions. The Office of Tourism in Quebec City has asked architects to design a new building that will increase tourism in the area. Your job is to create a new ice building based on the criteria provided by Quebec City's Office of Tourism.



Background Information

- An architect is a person who plans, designs, and oversees the construction of buildings.
- Explain to explorers that architects use different materials and supplies based on where they live in the world.
- Show **Discovery Link: Building With Ice and Snow**
 - Discuss:
 - Which features of the igloos in this video do you think you might see in an ice hotel?
 - Thinking about the catenary arch design and the effect it has on keeping heat in the igloo, is this a feature that you think an architect might include in guest rooms in a hotel? What level would you put a guest bedroom at?
 - What might builders have to do differently in a cold environment like this with these materials versus a warm environment?
 - Tell explorers that the next video features a previously built ice hotel in Quebec City. Ask them to look for features described in **Discovery Link: Building With Ice and Snow**.
- Show **Discovery Link: Quebec City Ice Hotel**



Activity (40-50 minutes):

Step 1: Prepare Snow (10 minutes)

- Explain to explorers that they will create their own ice building. First, they need to get their materials together before they start building.
- The first material they need is snow. Explain to explorers they will create their own snow for building.
- Provide explorers with **Discovery Handout: Snow Instructions**.
 - Have explorers work in small groups to prepare their snow based on the handout.
 - Provide each group with the following materials to create snow:



Career Adventures: Architect

Ice Architecture

- 6 cups corn flour
- 1 1/2 cup vegetable oil
- 10 Tablespoons glitter
- (optional) Food coloring

Step 2: Build Your Model (20-30 minutes)

- Next, it is time to build. Explain to explorers that architects receive a list of criteria from their client about what they want the ice building to look like. Explorers will work in small groups to review their client's criteria and then start building!
 - Provide explorers with **Discovery Handout: Ice Architecture Criteria**. As a group, review the criteria that the Office of Tourism has provided.
- Lay out the following materials for explorers to choose from:
 - Ice cubes
 - "Snow" - created in Step 1
 - Packing popcorn or marshmallows
 - Toothpicks
 - Cardboard (to provide a base for the structure)
 - Other art supplies and building materials
- Explain to explorers that their designs will be evaluated when they are finished to see if Quebec City's Office of Tourism will approve their design based on the criteria provided.

Step 3: Evaluate Design (10 minutes)

- Explain to explorers that each group will evaluate another group's design to see if it would be approved by Quebec City's Office of Tourism
- Provide explorers with **Discovery Page: Office of Tourism Evaluation for Ice Buildings**
 - Have groups switch designs with another group and fill out the questions on the page
 - Groups will make a formal recommendation to the Office of Tourism whether the design they evaluated meets the criteria provided
- Have groups share their feedback when they are finished evaluating.



Career Adventures: Architect

Ice Architecture

Materials List

Provided online:

- **Discovery Link: Building With Ice and Snow**
- **Discovery Link: Ice Hotel in Quebec City**
- **Discovery Handout: Snow Instructions**
- **Discovery Handout: Ice Architecture Criteria**
- **Discovery Page: Office of Tourism Evaluation for Ice Buildings**

Not provided:

- 3 (or more) ice cubes for each explorer
- Cardboard
- Rulers
- Packing popcorn or marshmallows
- Toothpicks
- Other art supplies and building materials
- Materials to create snow (amounts are for groups of 2-4 explorers)
 - 6 cups corn flour
 - 1 1/2 cup vegetable oil
 - 10 Tablespoons glitter
 - (optional) Food coloring
 - Mixing bowl
 - Measuring spoons
 - Mixing spoon

Contact Allison, Director of Customer Service, with any questions or feedback at 314-272-2560 or allison@rozzylearningcompany.com