



Smithsonian

Studying Snowflakes



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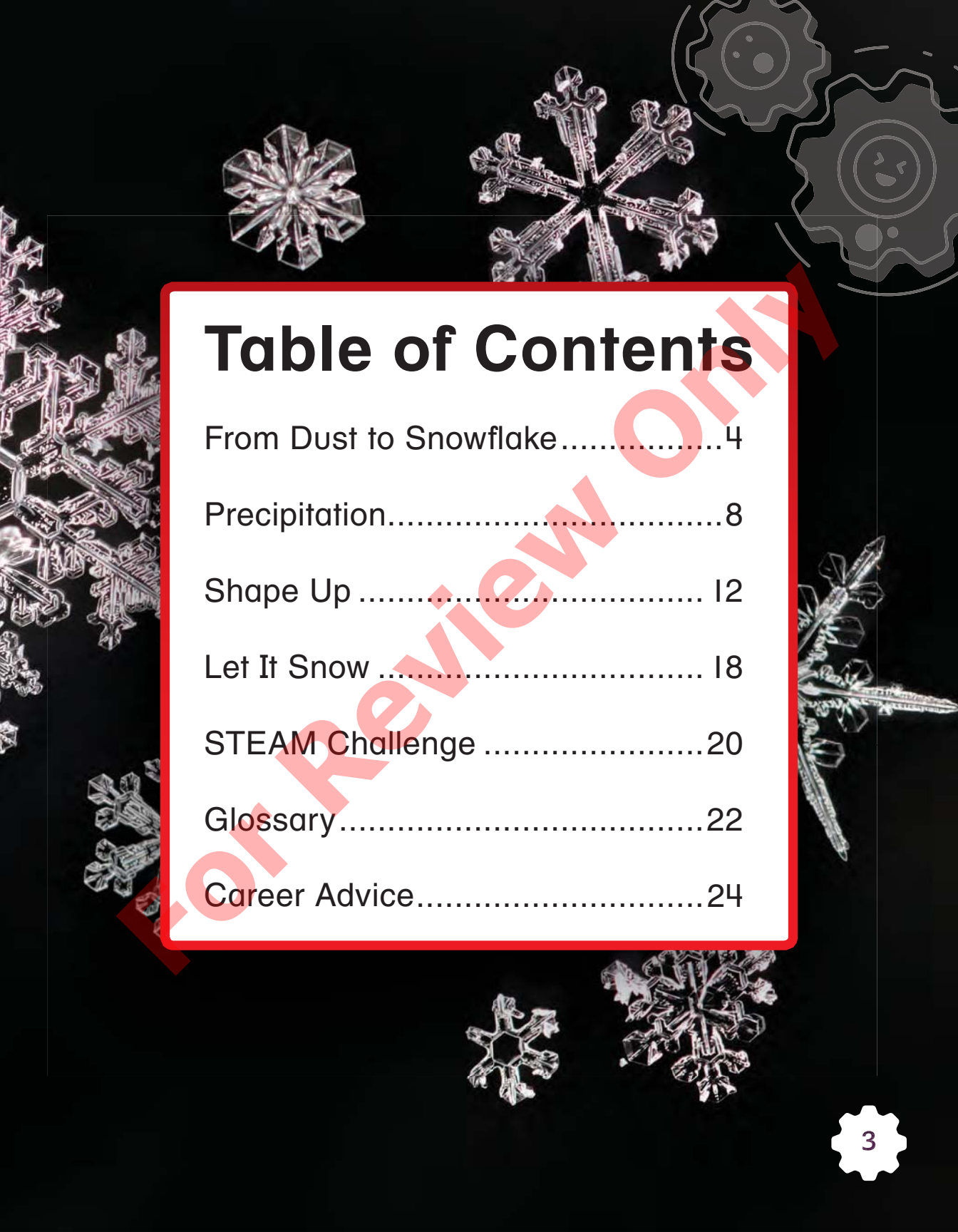
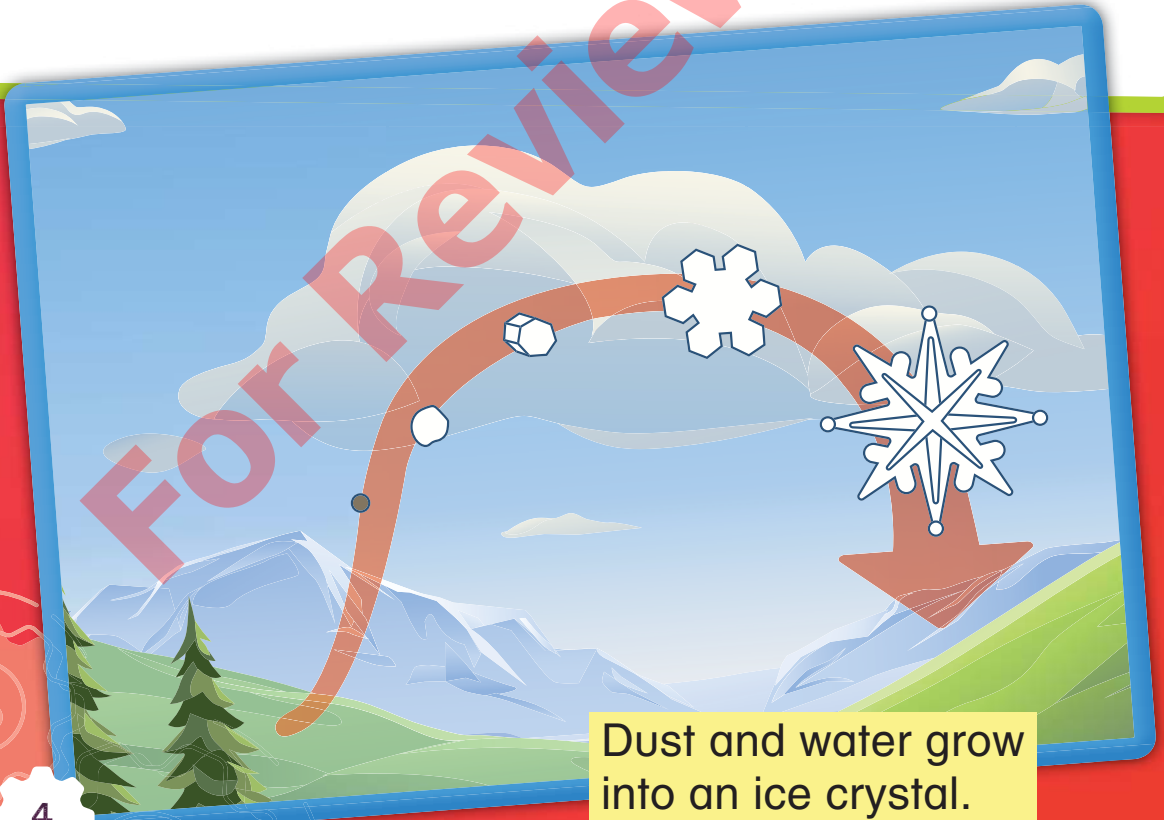


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From Dust to Snowflake

It starts with a speck of dust on a freezing day. A drop of cold water grabs onto the speck. The drop becomes an **ice crystal**. The ice crystal grows and grows.



Dust and water grow into an ice crystal.

ice crystals



The ice crystal becomes heavier than the air as it grows. It falls through the sky. It falls with other ice crystals. They are alike, but each one is different. They are unique. They are snowflakes!



Ice crystals are often called “snowflakes.”



Engineering & Mathematics

Snowflake Symmetry

Most snowflakes are **symmetrical**. This means if you fold the shape in half, both sides will match.

Precipitation

Snowflakes are one type of precipitation. There are also other types.

All precipitation starts as frozen water in the sky. Then, it falls to the earth. It can be liquid like rain. It can be solid like snow.

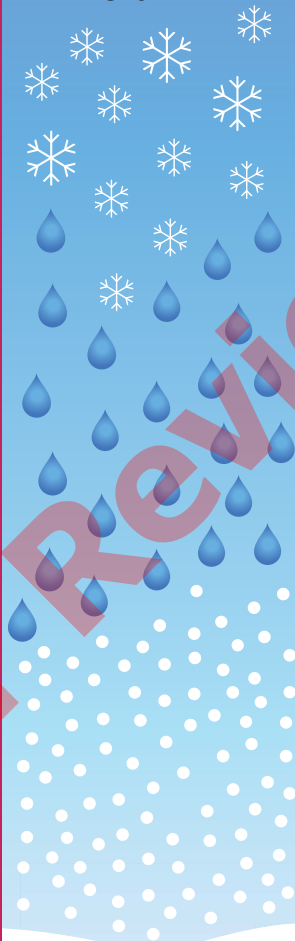


Types of Precipitation

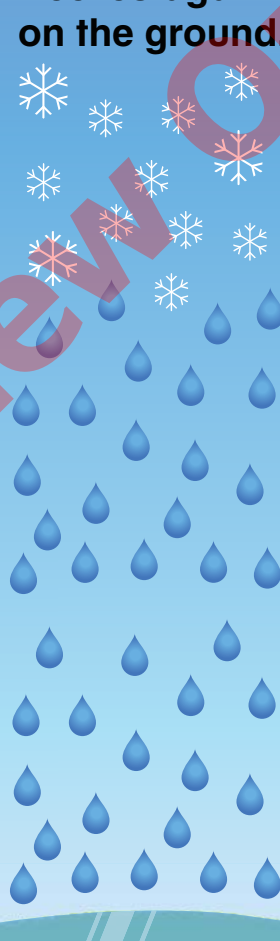
Snow stays frozen.



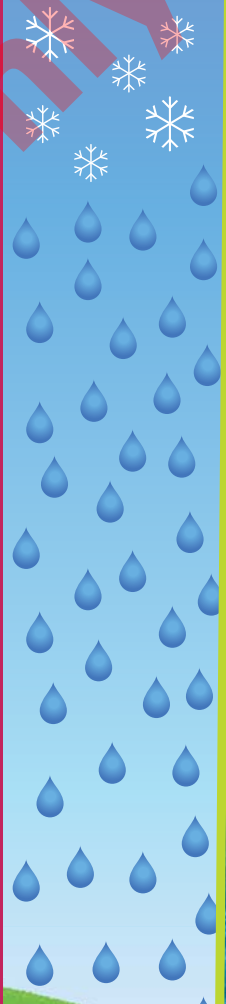
Sleet melts. It freezes again in the air.

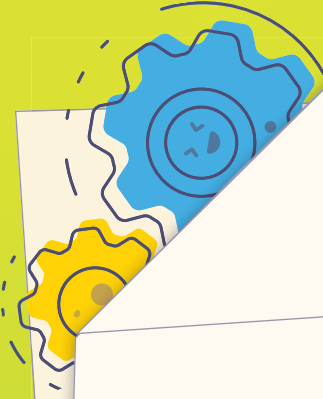


Freezing rain melts. It freezes again on the ground.



Rain melts.





STEAM CHALLENGE

The Problem

You are going to the Arctic to study snowflakes. First, you must build an igloo to live in. It will be made of blocks of snow. What shape should your igloo be so that it stays strong?

The Goals

- Make a model of your igloo with marshmallows, sugar cubes, tape, and/or glue.
- Make the igloo hollow so there is room for you to live inside.
- Make the igloo strong enough to hold a metal washer without breaking.





Research and Brainstorm

Why do snowflakes stick together?
Why can igloos only be made in freezing places?



Design and Build

Draw your plan. How will it work?
What materials will you use? Build your model!



Test and Improve

Place a metal washer on top of your igloo for one minute. Did the igloo stay whole? Did it break? Can you make it better? Try again.



Reflect and Share

How big do you think an igloo can be and still stand? What else could be built from snow or ice?