

Hour of Code Frozen Tutorial

Notes and Cheat Sheet

[Code.org](http://code.org) or <http://hourofcode.com/frzn>

Logistical Considerations

Computers or Tablets—Each participant should have access to a computer or tablet with Internet access.

Printing—The tutorial allows participants to print their snowflake creations at certain points throughout the tutorial. At the end, participants can print a personalized certificate and a sheet with six snowflake designs at the end.. How will you handle printing? You may also want to print copies of the Visualizing Angles handout prior to the session.

Posting to Social Media—The tutorial allows participants to post their creations on social media. How will you address posting to social media?

Video and Audio—The tutorial includes video clips introducing the tutorial and programming concepts. If working on their own, it may be helpful for participants to have ear buds or head phones. If you want to play video (especially the first video) for the group, you can set up tabs to the videos before the session using the following links:

- Frozen-Hour of Code Introduction (3:00) <https://www.youtube.com/watch?v=H1-paxNG4kw>
- Math is Fun--Angles (about 1 minute) <http://www.mathsisfun.com/angles.html>
- Loops (1:16) <https://www.youtube.com/watch?v=d7e48cYq7uc>
- Functions (1:37) <https://www.youtube.com/watch?v=0eo0ESEX9DE>

Pre-Coding Exercises and Resources

How to Teach One Hour of Code

<http://hourofcode.com/us/resources/how-to>

Unplugged: The Drawing Machine (Optional)

<http://code.org/curriculum/misc/hocunplugged/Teacher>

Video: Frozen-Hour of Code Introduction (3:00)

<https://www.youtube.com/watch?v=H1-paxNG4kw>

Angles—Review (Optional)

- Math is Fun--Angles (about a minute)
<http://www.mathsisfun.com/angles.html>
- Visualizing Angles Handout
http://code.org/curriculum/misc/hocunplugged/visualizing_angles.pdf

Visualizing Angles

Turn Left



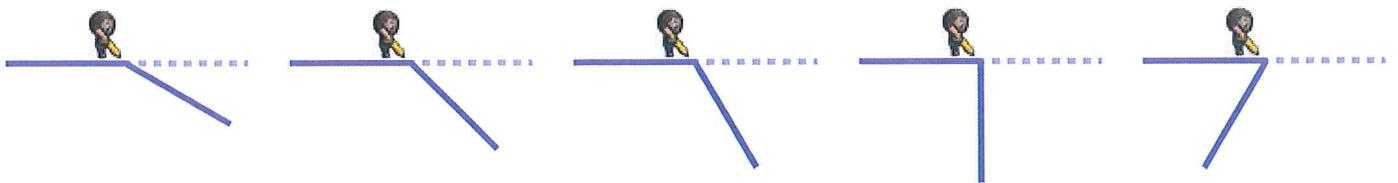
30°

45°

60°

90°

120°

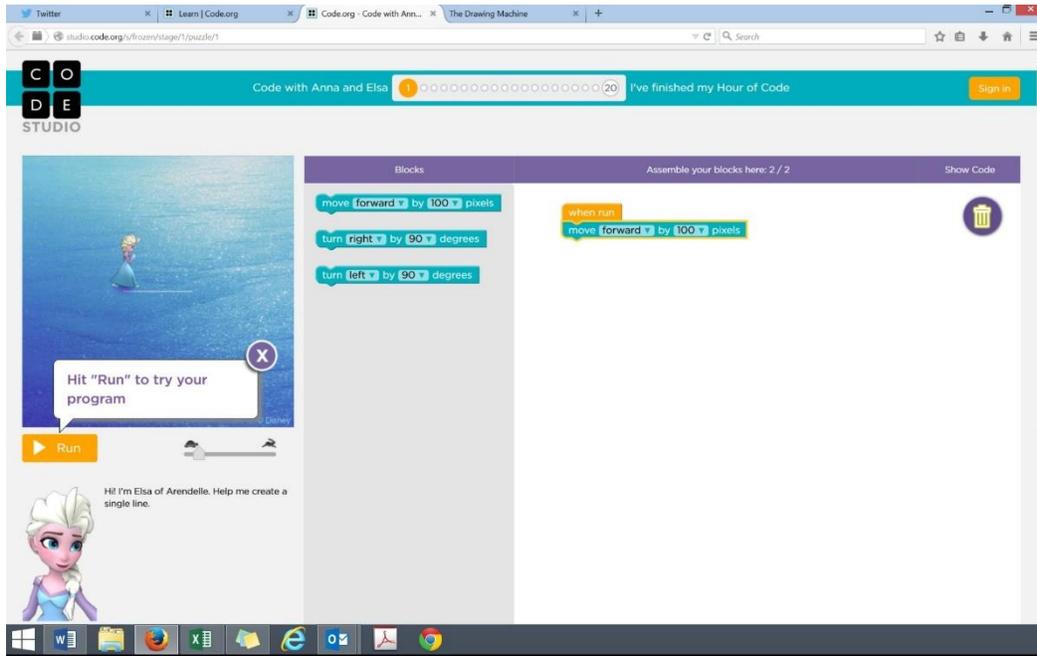


Turn Right

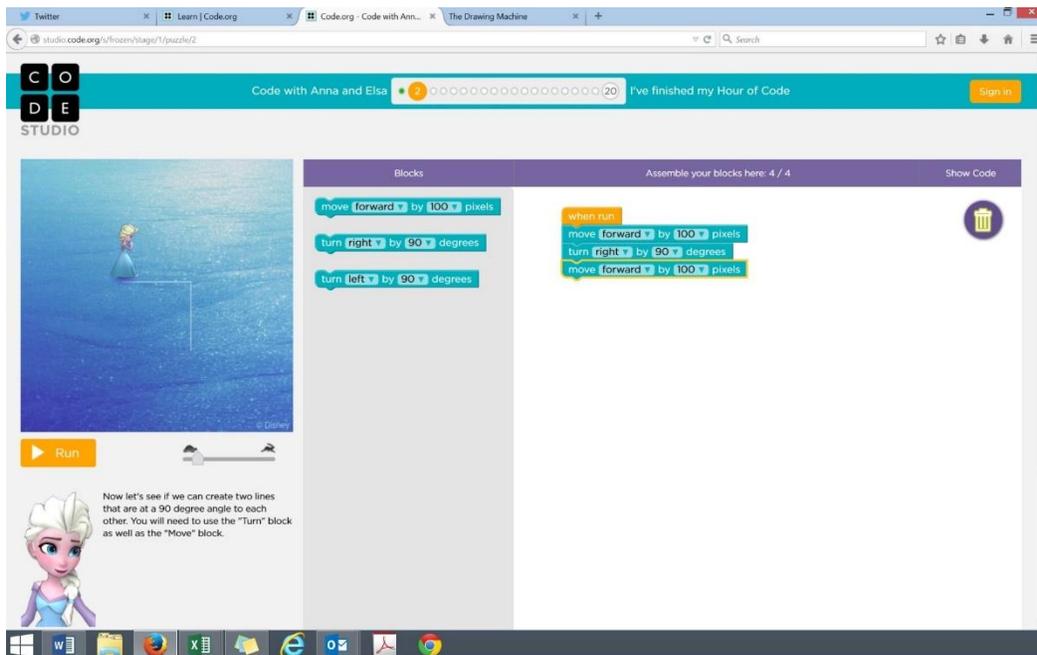
Frozen Tutorial Cheat Sheet

Video: Frozen-Hour of Code Introduction (3:00) <https://www.youtube.com/watch?v=H1-paxNG4kw>

Puzzle 1



Puzzle 2



Puzzle 3

Code with Anna and Elsa 20 I've finished my Hour of Code Sign in

STUDIO

move forward by 100 pixels
turn right by 90 degrees
turn left by 90 degrees

when run
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels

Attach more blocks here to create a square

It seems like we're halfway to making a square. Let's put 4 lines together to create a square.

Video: Loops (1:16) <https://www.youtube.com/watch?v=d7e48cYq7uc>

Puzzle 4

Code with Anna and Elsa 20 I've finished my Hour of Code Sign in

STUDIO

when run
repeat 4 times
do
move forward by 100 pixels
turn right by 90 degrees

Hi, I'm Anna of Arendelle! Let's make a square with the "Repeat" block, which uses fewer blocks. How many times (???) should the "Repeat" block loop the blocks inside it to make a square?

Puzzle 5

Code with Anna and Elsa ★★★★● I've finished my Hour of Code Sign in

STUDIO

Assemble your blocks here: 6 / 6 Show Code

```
when run
  repeat 3 times
  do
    repeat 4 times
    do
      move forward by 100 pixels
      turn right by 90 degrees
      turn right by 120 degrees
```

Run

Let's create three squares, turning after each square. Be sure to turn by 120 degrees before each new square.

Puzzle 6

Code with Anna and Elsa ★★★★● I've finished my Hour of Code Sign in

STUDIO

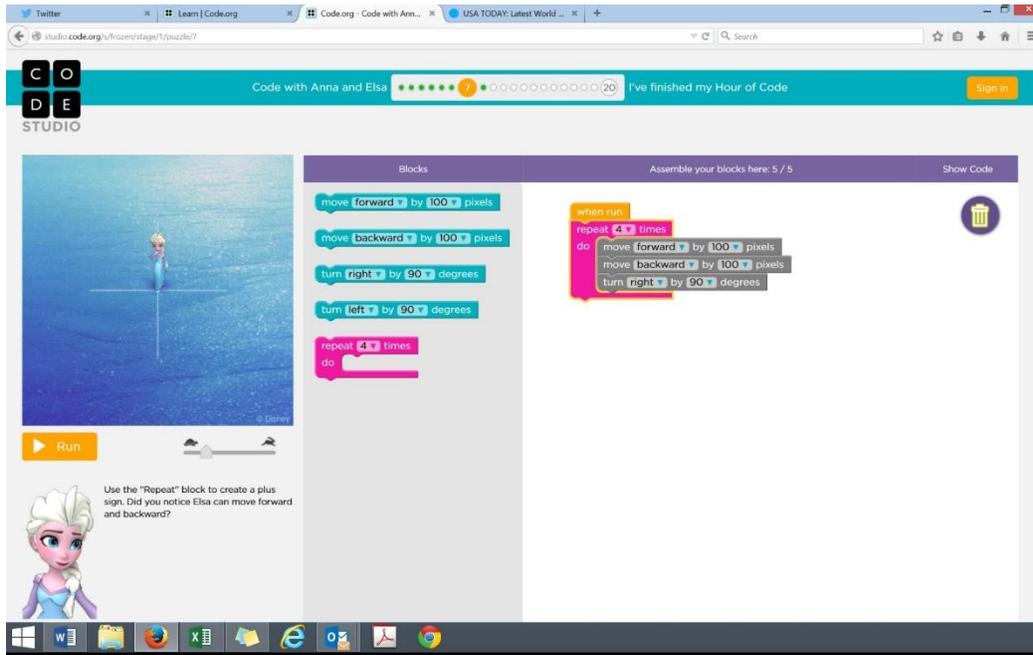
Assemble your blocks here: 6 / 6 Show Code

```
when run
  repeat 10 times
  do
    repeat 4 times
    do
      move forward by 100 pixels
      turn right by 90 degrees
      turn right by 36 degrees
```

Run

Can you create a snowflake using the "Repeat" block to make a square 10 times, and the "Turn" block to turn 36 degrees between each square?

Puzzle 7

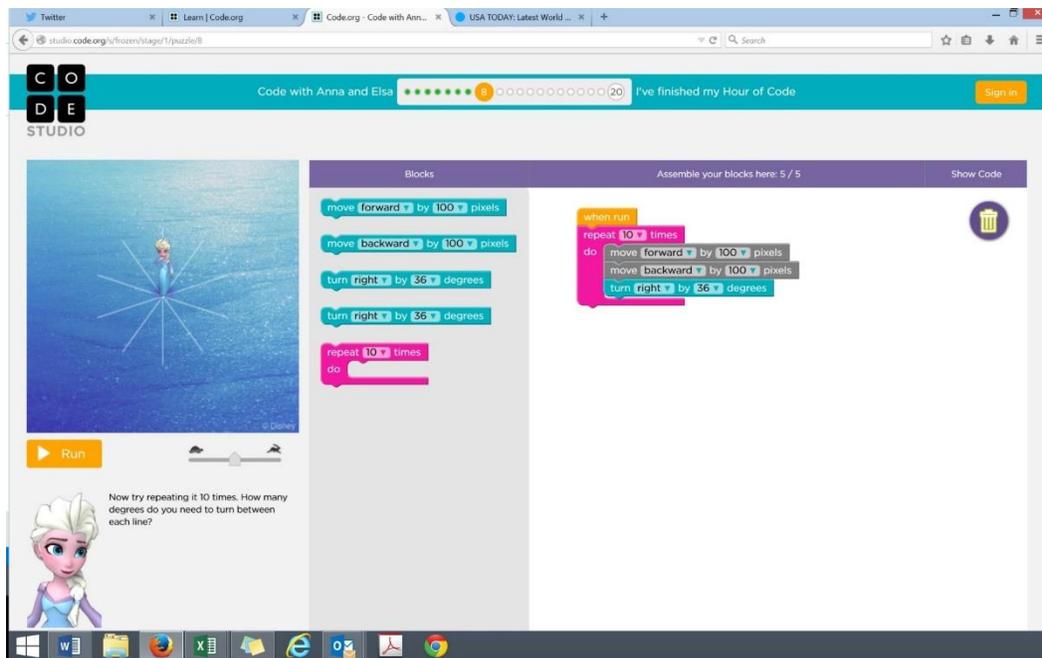


The screenshot shows the Code.org interface for Puzzle 7. The top navigation bar includes the Code.org logo, the text "Code with Anna and Elsa", a progress indicator with 20 circles (the 7th is filled), and a "Sign in" button. The main workspace is divided into three sections:

- Stage:** A 3D scene with Elsa on a blue ice surface. A plus sign (+) is visible on the ice.
- Blocks:** A list of available blocks: "move forward by 100 pixels", "move backward by 100 pixels", "turn right by 90 degrees", "turn left by 90 degrees", and a "repeat 4 times" block.
- Script Area:** A script containing a "when run" block followed by a "repeat 4 times" block. The "do" sub-block contains: "move forward by 100 pixels", "move backward by 100 pixels", and "turn right by 90 degrees".

Below the stage, there is a "Run" button and a slider. A text box with Elsa's avatar asks: "Use the 'Repeat' block to create a plus sign. Did you notice Elsa can move forward and backward?"

Puzzle 8

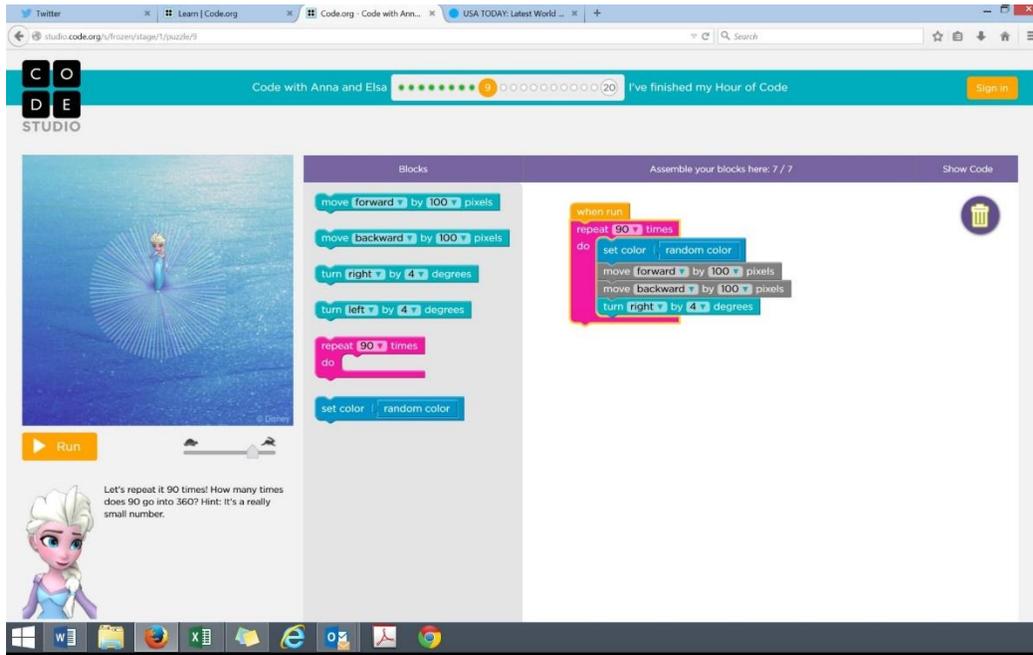


The screenshot shows the Code.org interface for Puzzle 8. The top navigation bar is identical to Puzzle 7. The main workspace is divided into three sections:

- Stage:** A 3D scene with Elsa on a blue ice surface. A starburst pattern of lines is visible on the ice.
- Blocks:** A list of available blocks: "move forward by 100 pixels", "move backward by 100 pixels", "turn right by 36 degrees", "turn left by 36 degrees", and a "repeat 10 times" block.
- Script Area:** A script containing a "when run" block followed by a "repeat 10 times" block. The "do" sub-block contains: "move forward by 100 pixels", "move backward by 100 pixels", and "turn right by 36 degrees".

Below the stage, there is a "Run" button and a slider. A text box with Elsa's avatar asks: "Now try repeating it 10 times. How many degrees do you need to turn between each line?"

Puzzle 9



Code with Anna and Elsa 0 I've finished my Hour of Code Sign in

STUDIO

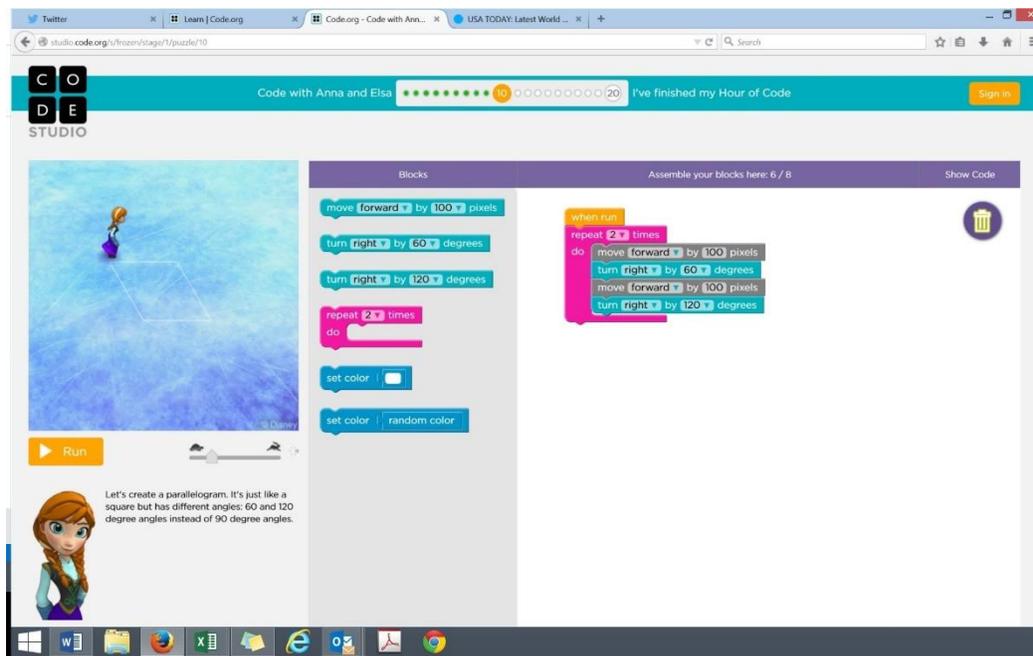
Blocks Assemble your blocks here: 7 / 7 Show Code

when run
repeat 90 times
do
set color random color
move forward 100 pixels
move backward 100 pixels
turn right 4 degrees

Run

Let's repeat it 90 times! How many times does 90 go into 360? Hint: It's a really small number.

Puzzle 10



Code with Anna and Elsa 0 I've finished my Hour of Code Sign in

STUDIO

Blocks Assemble your blocks here: 6 / 8 Show Code

when run
repeat 2 times
do
move forward 100 pixels
turn right 60 degrees
move forward 100 pixels
turn right 120 degrees

Run

Let's create a parallelogram. It's just like a square but has different angles: 60 and 120 degree angles instead of 90 degree angles.

Puzzle 11

Code with Anna and Elsa 10/20 I've finished my Hour of Code Sign in

STUDIO

Blocks: Assemble your blocks here: 8 / 10 Show Code

when run
repeat 4 times
do
move forward by 100 pixels
turn right by 60 degrees
move forward by 100 pixels
turn right by 120 degrees
turn right by 90 degrees

Did you know every snowflake is a different shape? Let's create a new snowflake by using the "Repeat" block to repeat a parallelogram 4 times, turning right by 90 degrees between each parallelogram.

Puzzle 12

Code with Anna and Elsa 10/20 I've finished my Hour of Code Sign in

STUDIO

Blocks: Assemble your blocks here: 8 / 10 Show Code

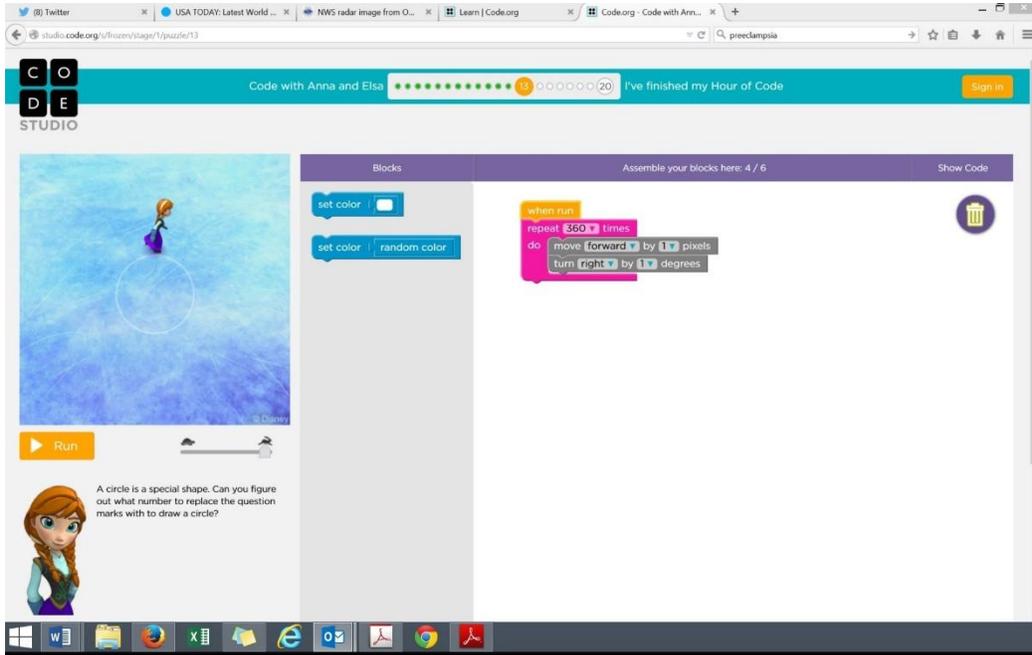
when run
repeat 10 times
do
repeat 2 times
do
move forward by 100 pixels
turn right by 60 degrees
move forward by 100 pixels
turn right by 120 degrees
turn right by 36 degrees

move forward by 100 pixels
turn right by 36 degrees
turn left by 36 degrees
repeat 10 times
do
set color
set color random color

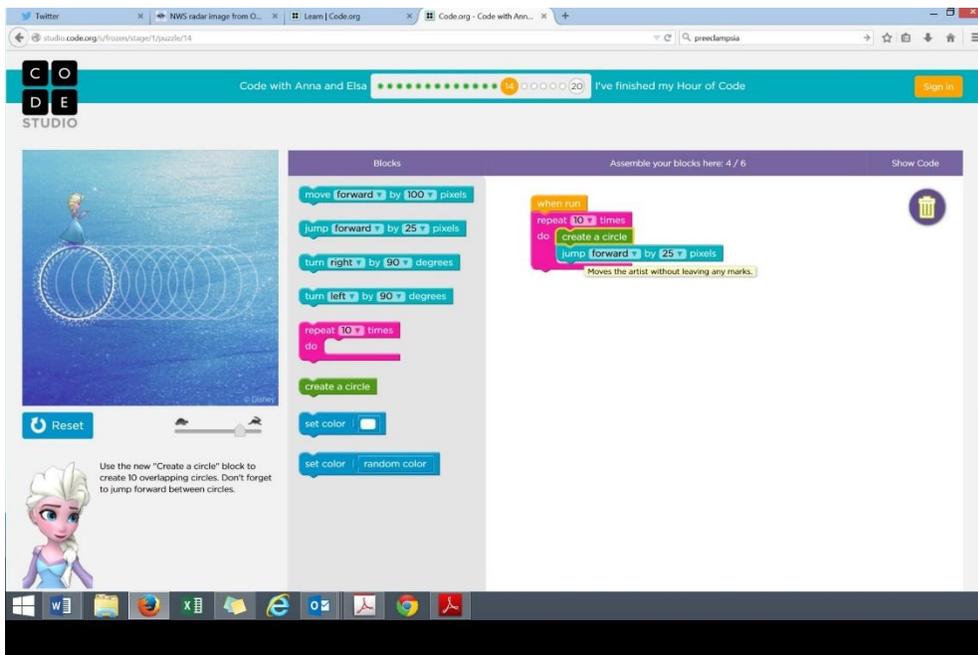
Now, let's create a new snowflake by using the repeat block to repeat a parallelogram 10 times, turning right by 36 degrees between each one.

Video: Functions (1:37) <https://www.youtube.com/watch?v=0eo0ESEX9DE>

Puzzle 13



Puzzle 14



Puzzle 15

Code with Anna and Elsa

STUDIO

Blocks

Assemble your blocks here: 5 / 8

Show Code

move forward by 100 pixels

jump forward by 50 pixels

turn right by 18 degrees

turn left by 18 degrees

repeat 20 times

do

create a circle

jump forward by 50 pixels

turn right by 18 degrees

Run

Now let's create 20 overlapping circles, turning 18 degrees between each circle.

Puzzle 16

Code with Anna and Elsa

STUDIO

Blocks

Assemble your blocks here: 5 / 7

Show Code

move forward by 100 pixels

turn right by 90 degrees

turn left by 90 degrees

jump forward by 100 pixels

create a circle

size: ???

set color

set color random color

Run

Here's a "Create circle" block that can make circles of different sizes. Can you use this to create a small circle of size 5 and a larger circle of size 10?

Puzzle 19

Code with Anna and Elsa 19 I've finished my Hour of Code Sign in

STUDIO

move forward by 100 pixels
turn right by 45 degrees
turn left by 45 degrees
repeat 8 times
do
create a snowflake branch
set color
set color random color

when run
repeat 3 times
do
create a snowflake branch
turn right by 45 degrees

Run

Now let's repeat it 8 times to make a beautiful snowflake!

Puzzle 20

Code with Anna and Elsa 20 I've finished my Hour of Code Sign in

STUDIO

move forward by 100 pixels
turn right by 90 degrees
turn left by 90 degrees
jump forward by 100 pixels
create a circle
size: 0
create a snowflake of type square
repeat 3 times
do
set color
set color random color

when run
repeat 3 times
do
set color random color
create a snowflake of type fractal
turn right by 90 degrees
jump forward by 120 pixels

Run

You've officially become a master artist!
Create a winter wonderland.

Create Certificate

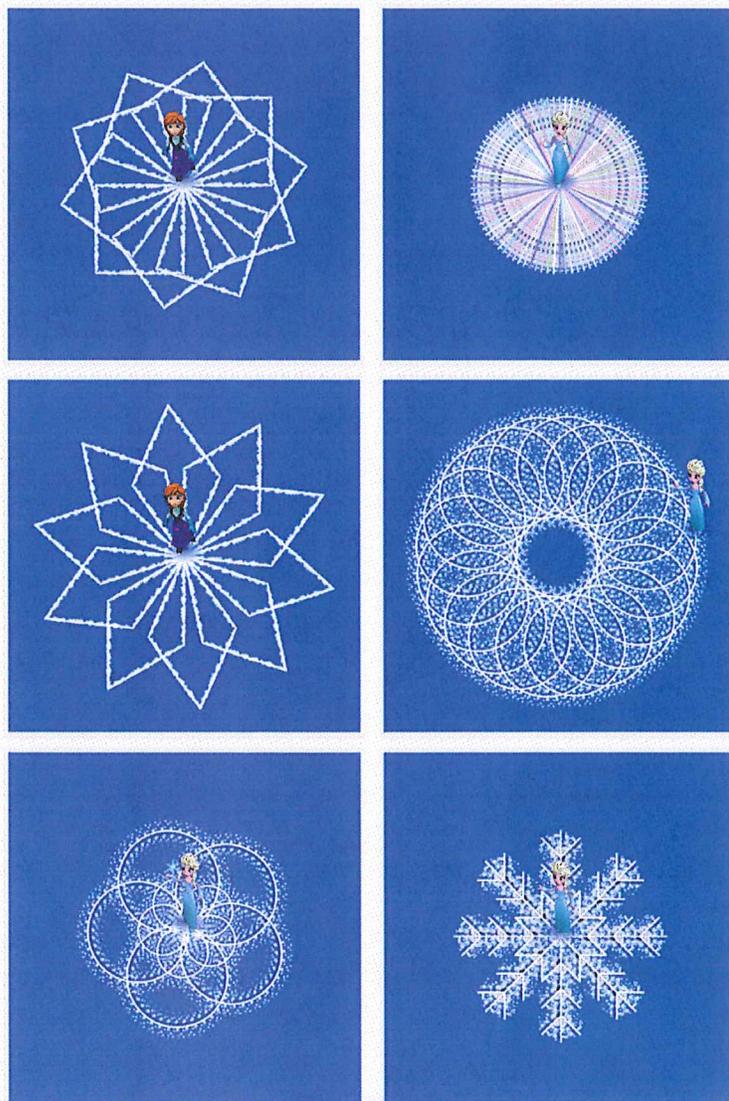
At the end, participants can print certificates and a one page sheet with six snowflake designs.

The screenshot shows the Code.org website's 'Congratulations on completing one Hour of Code' page. The page is designed to celebrate a user's achievement and provide options for sharing and further learning. Key elements include:

- Navigation:** A teal header with the Code.org logo and links for 'LEARN', 'TEACH', 'STATS', 'HOW TO HELP', and 'ABOUT'. A 'Sign in' button is also present.
- Congratulations:** A large heading 'Congratulations on completing one Hour of Code' is centered at the top.
- Certificate Preview:** A decorative 'Certificate of Completion' is shown, awarded for the 'successful completion of The Hour of Code'. It includes the Code.org logo and a 'GREAT WORK' seal.
- Personalization:** A 'Personalize your certificate' section with a 'Name' input field and a 'Submit' button.
- Sharing:** A 'Share your achievement' section with buttons for 'Share on Facebook' and 'Share on Twitter'.
- Ice Art:** A 'Print your ice art' section with a note '(or make advanced art with zombie)' and a row of six snowflake icons, followed by a 'Print all' button.
- Next Steps:** A 'Continue learning beyond One Hour' section with buttons for 'Continue to the next level', 'Try other courses online', and 'Find local classes'.
- Leaderboards:** A section titled 'Leaderboards for the Hour of Code' with input fields for 'Country', 'City', and 'Gender'.

Your Ice Art

Thank you for participating in the Hour of Code, and learning to use computer programming to create ice art such as the examples below!



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