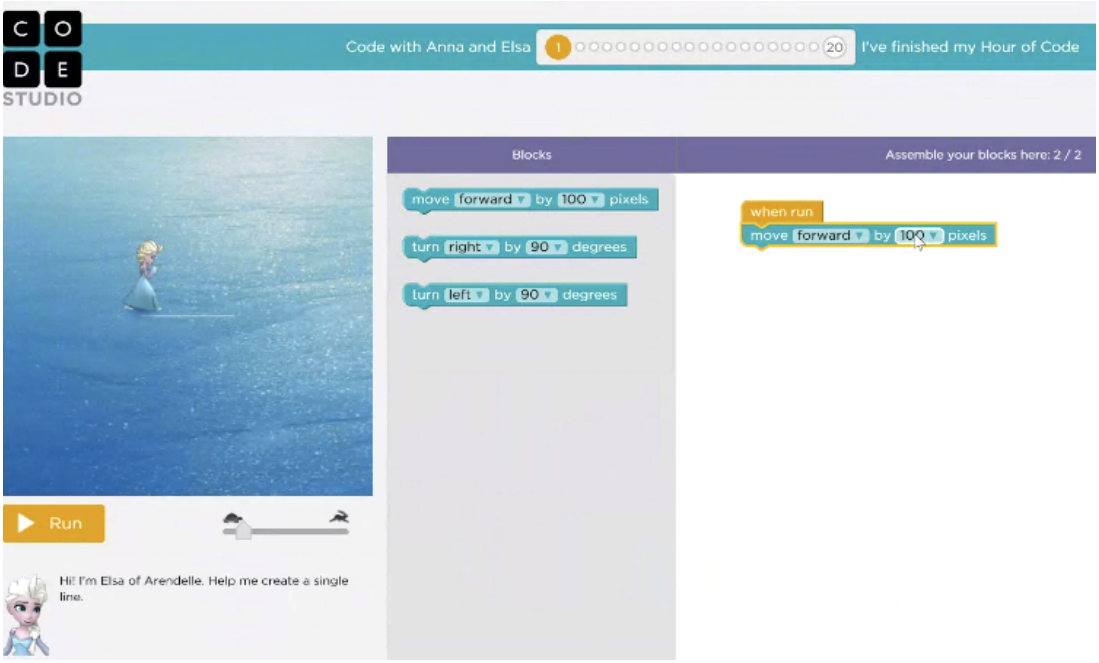
# FROZEN TUTORIAL

## ANSWER SHEET

REMINDER: Kids under 13 must not share on social media!

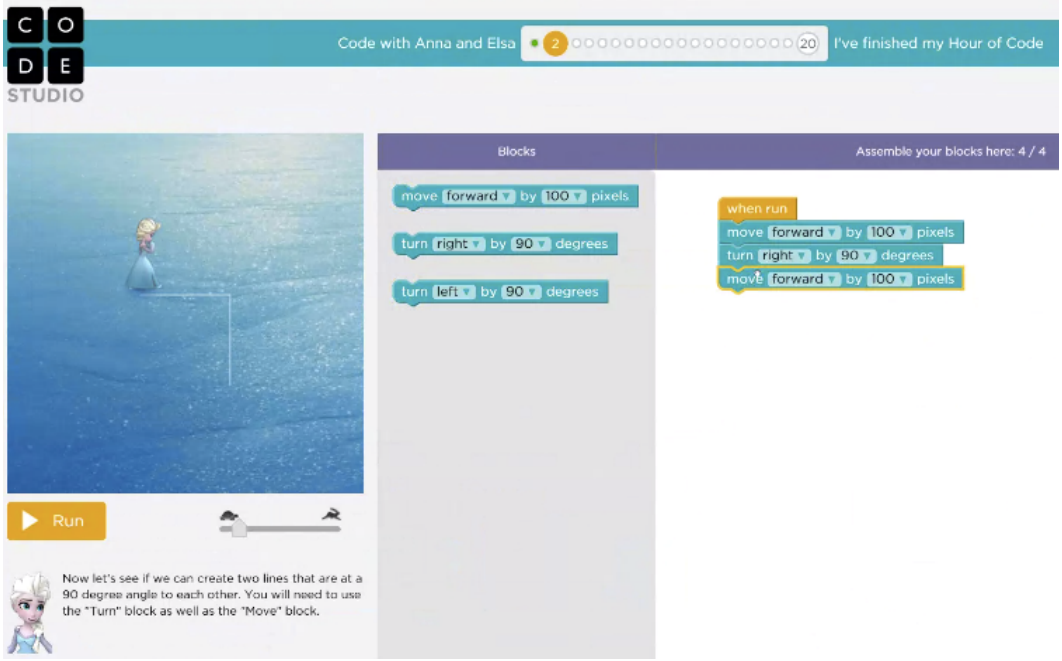
**PUZZLE #1**

1. When Run
2. Move forward by 100 pixels




**PUZZLE #2**

1. When Run
2. Move forward by 100 pixels
3. Turn right by 90 degrees
4. Move forward by 100 pixels

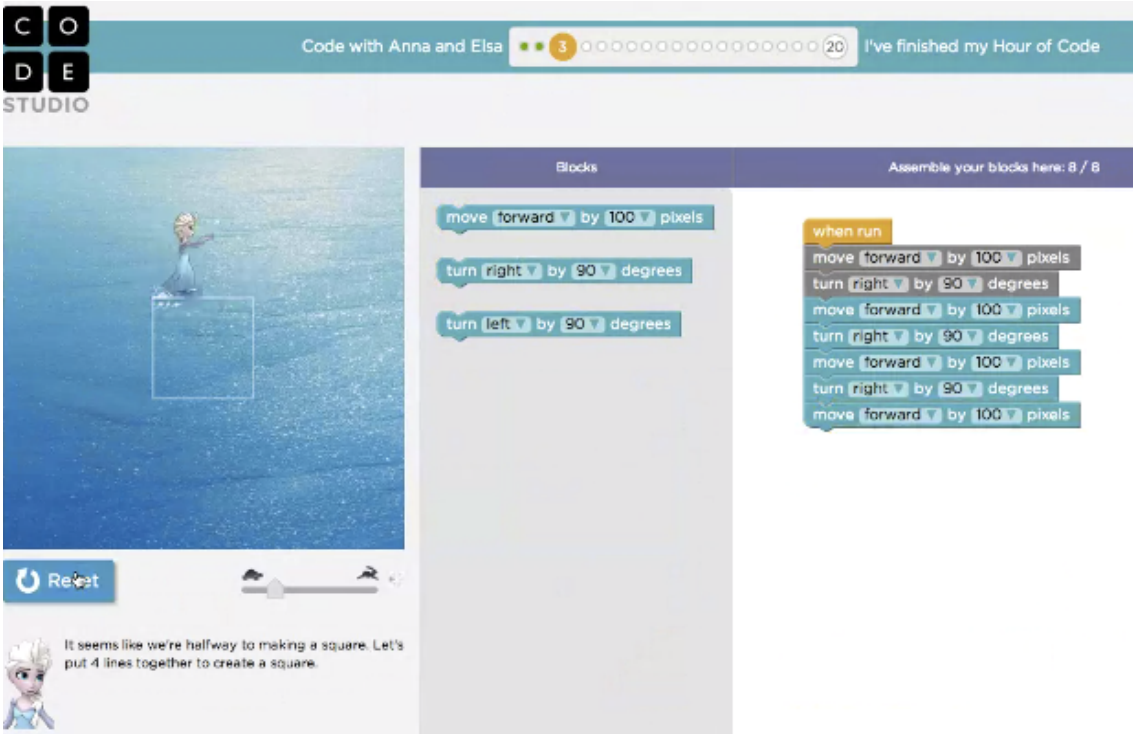


**PUZZLE #3**

*Attach more blocks under grey blocks to create a square.*

Steps by Step:

1. When run
2. Move forward by 100 pixels
3. Turn right by 90 degrees
4. Move forward by 100 pixels
5. Turn right by 90 degrees
6. Move forward by 100 pixels
7. Turn right by 90 degrees
8. Move forward by 100 pixels

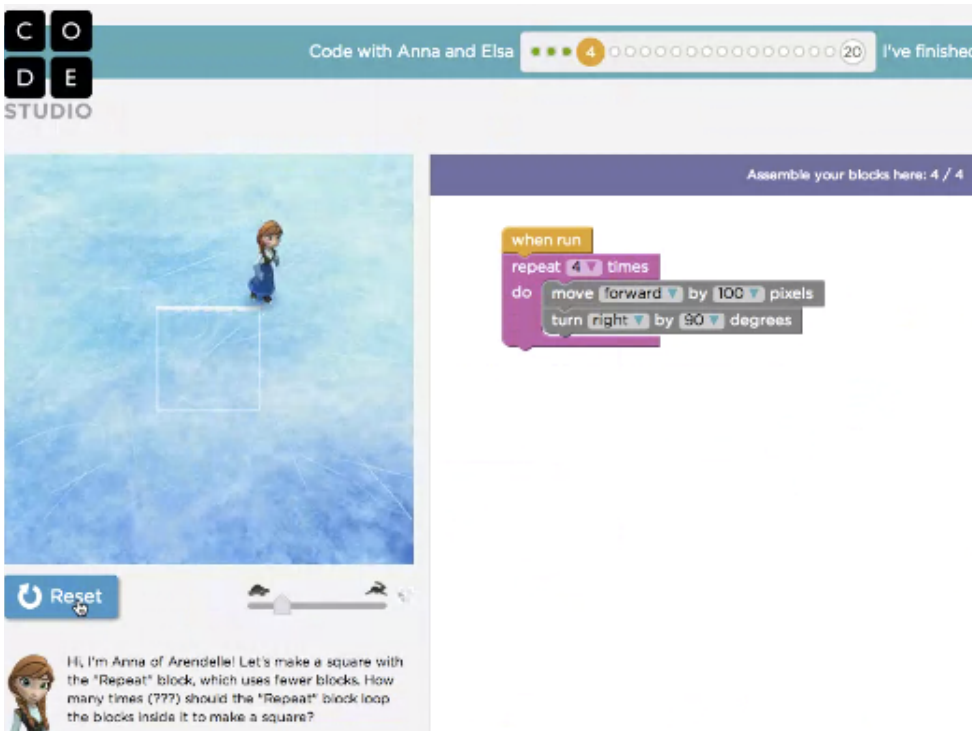



**PUZZLE #4**

*How many times should Anna Repeat the steps?*

*Use Drop Down to write:*

1. When run
2. Repeat 4 times
3. Inside Repeat 4 Times: move forward by 100 pixels
4. Inside Repeat 4 Times: turn right by 90 degrees



**PUZZLE # 5**

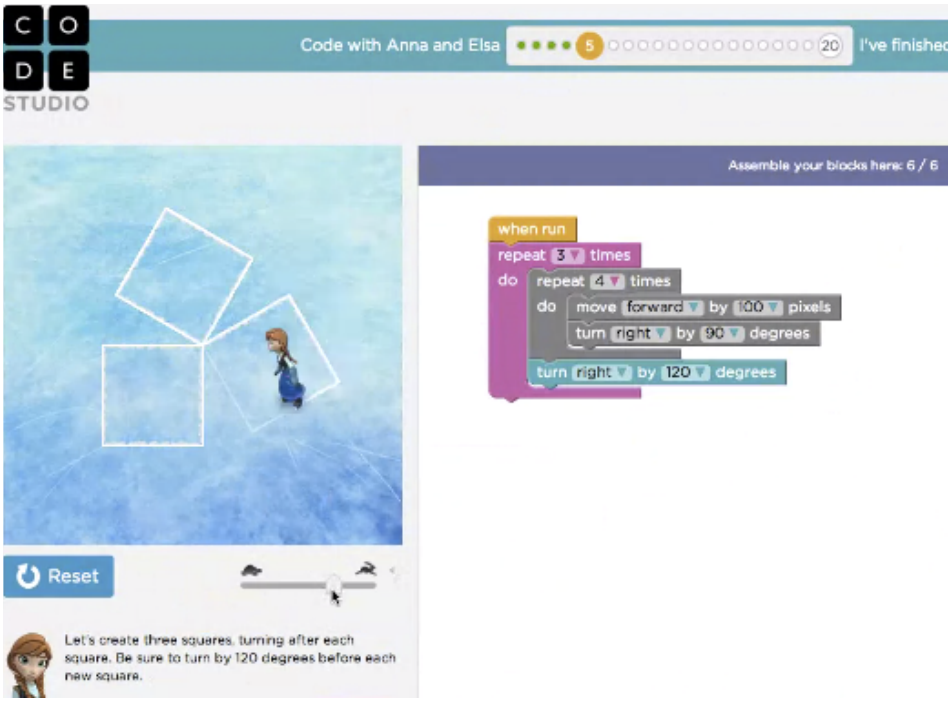
*Create 3 squares, turning after each square. Turn by 120 degrees before each new square.*

Answer how many times you repeat:

- From drop down repeat 3 times

Answer by how many degrees:

- From drop down turn right by 120 degrees




**PUZZLE #6**

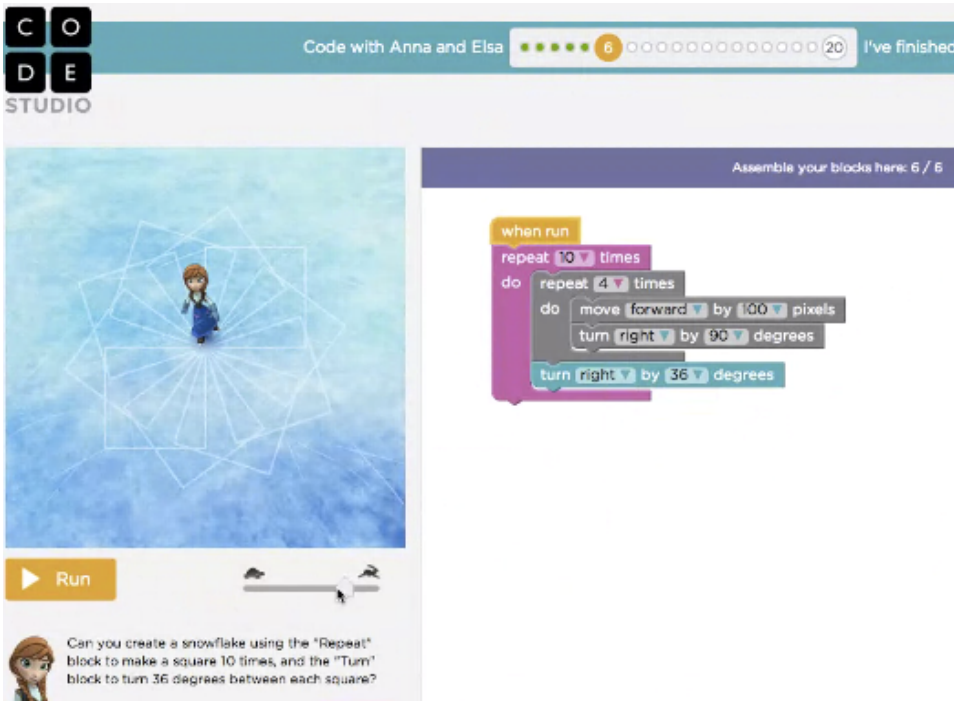
*Create a snowflake using the "Repeat" block to make a square 10 times, and the "Turn" block to turn 36 degrees between each square.*

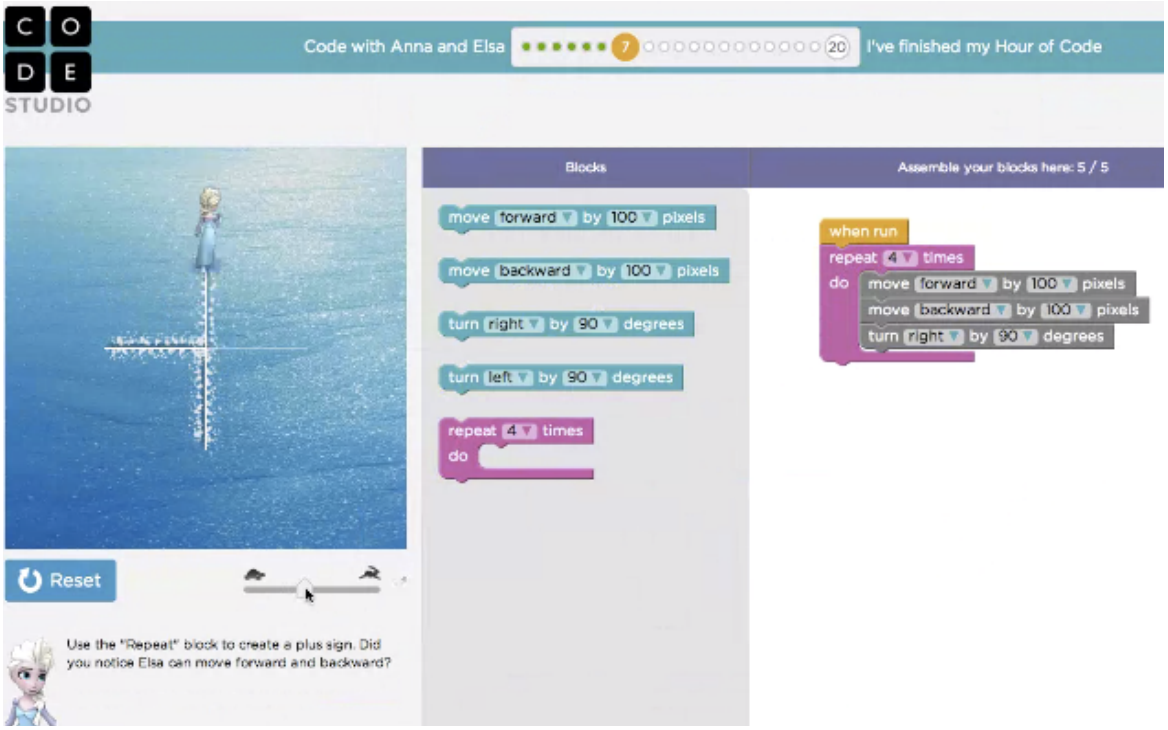
Answer to how many times you repeat:

- From drop down repeat 10 times

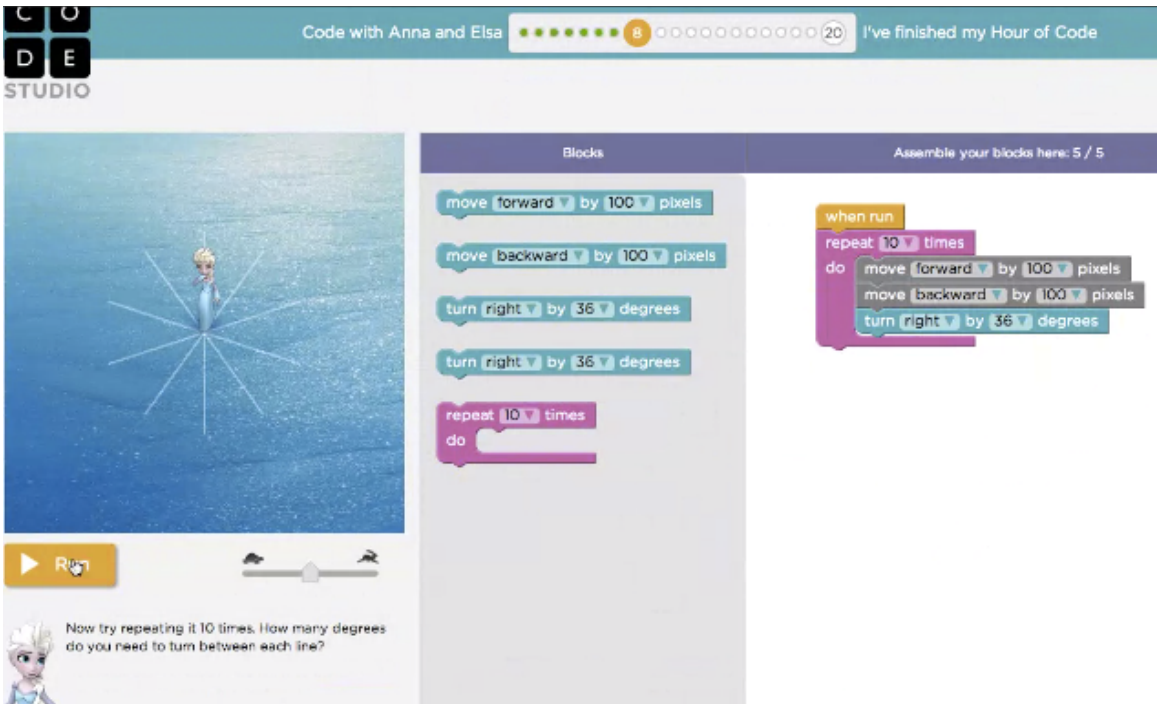
Answer to by how many degrees:

- From drop down turn right by 36 degrees

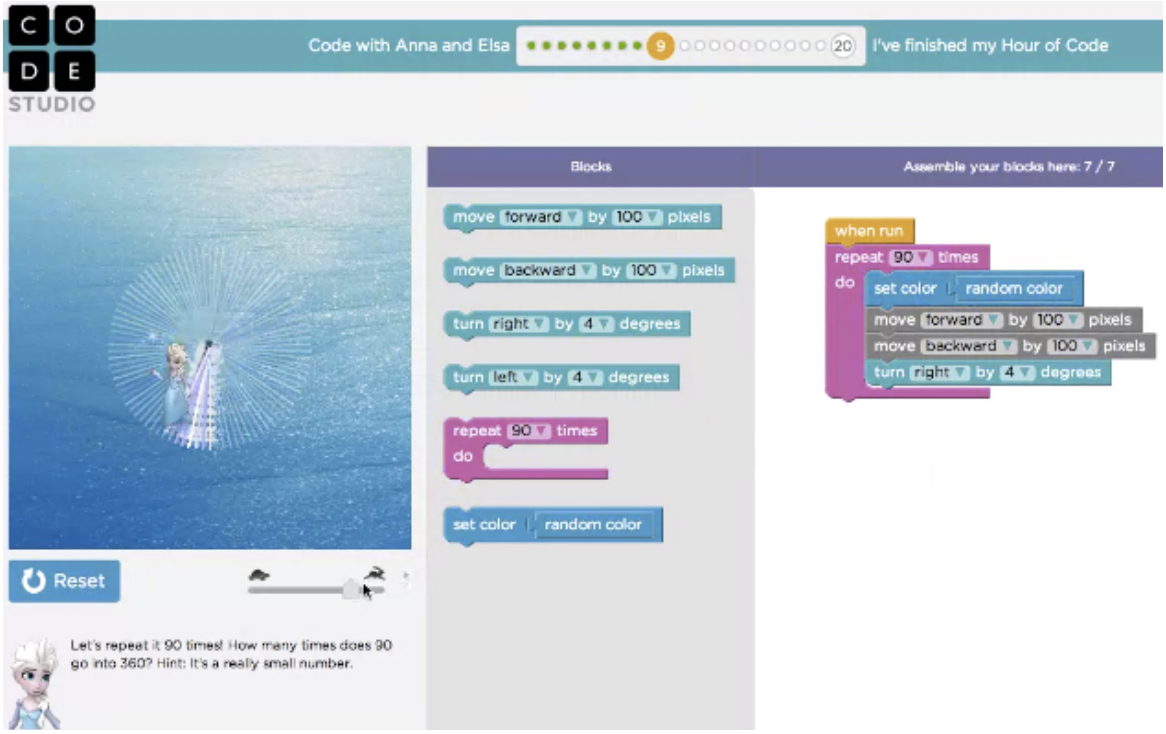




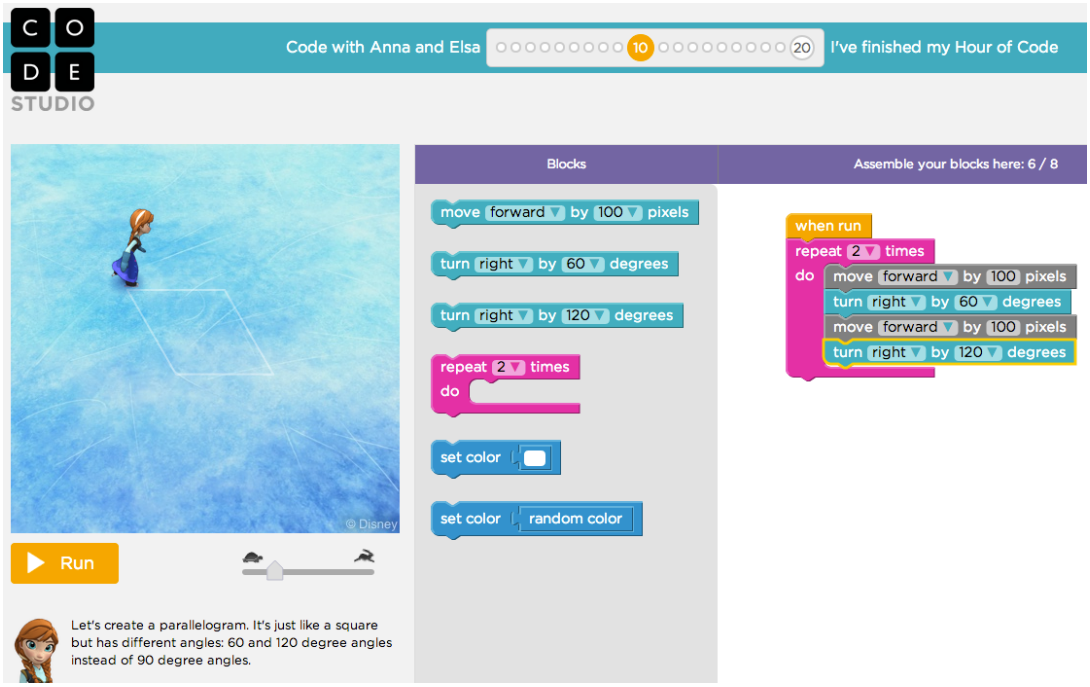

**PUZZLE #7** – *Use the "Repeat" block to create a plus sign. Did you notice Elsa can move forward and backward?*
Answer: Move the pink "Repeat" block underneath "When Run". Then move the grey blocks inside the pink repeat block.



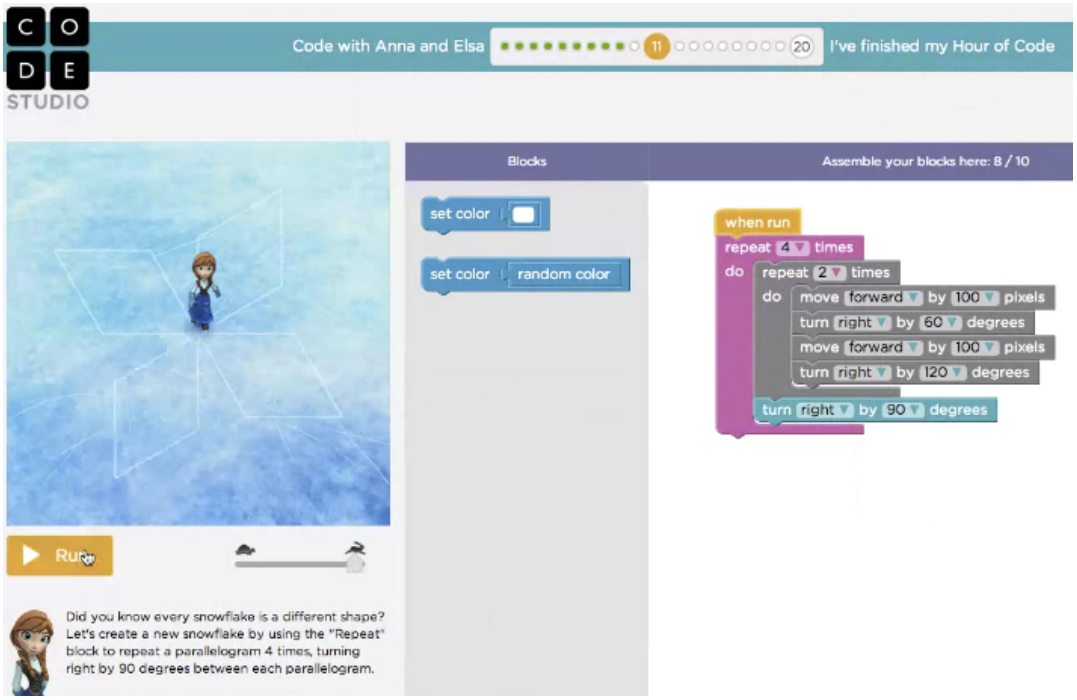

**PUZZLE #8** – Try repeating it 10 times. How many degrees do you need to turn between each line?
Answer: Move the pink repeat block under when run. Move the grey blocks and blue block inside the pink block. From the drop down in the blue block – turn right by "36" degrees.




**PUZZLE #9** – Repeat 90 times. How many times does 90 go into 360?
**Answer:** Move pink repeat block under "when run". Drop the blue/grey/grey/turquoise blocks inside of the pink block. In the turquoise block, use the drop down to change it to turn right by "4" degrees

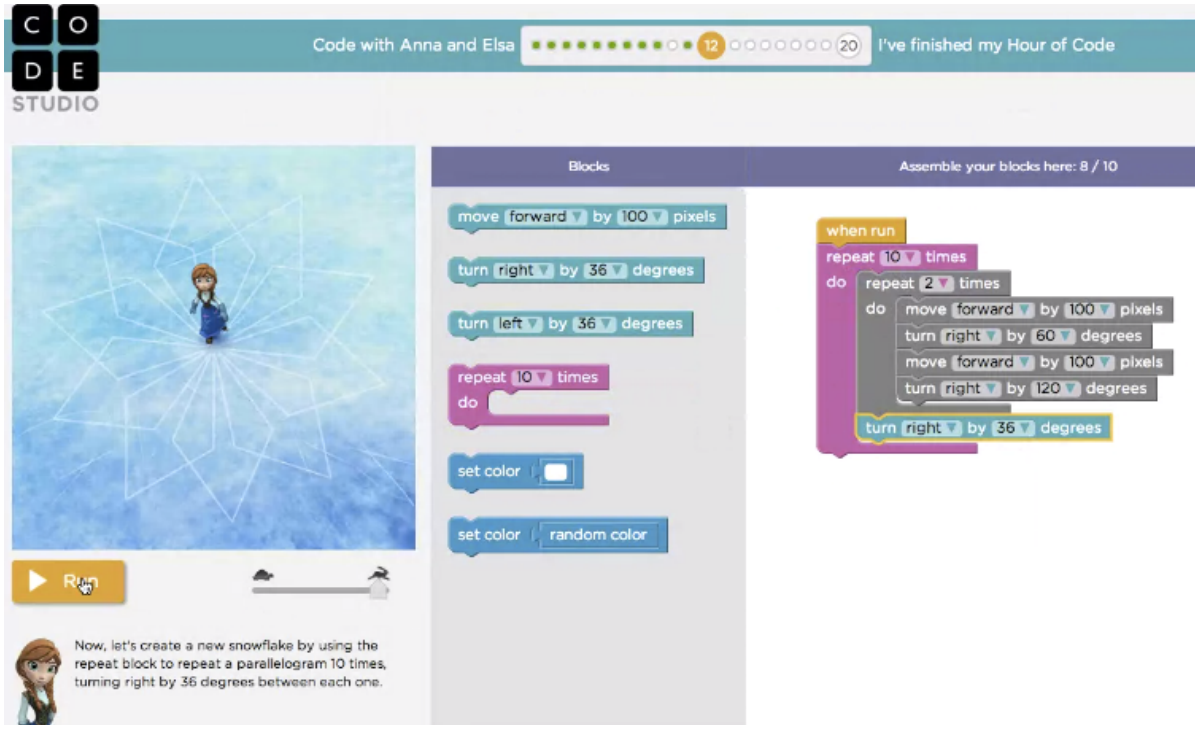



**PUZZLE #10** – Create a parallelogram. The angles needed are 60 and 120 degree angles instead of the 90 degree angles needed in a square.
**Answer:** Place the pink repeat block underneath "when run". Drop the grey/blue/grey/blue blocks inside of the pink repeat block. Change the first blue line to read "turn right by 60 degrees". Change the second blue line to read "turn right by 120 degrees".



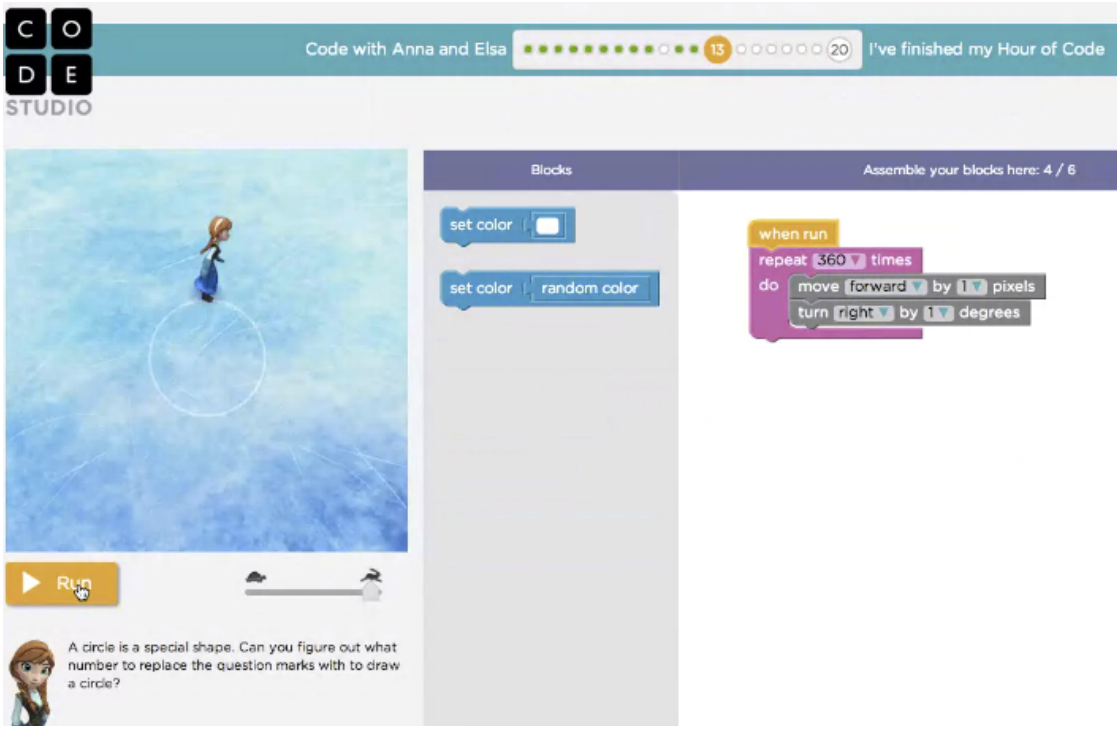

**PUZZLE #11** – *Create a snowflake using the "repeat" block to repeat the parallelogram 4 times, turning right by 90 degrees between each parallelogram. BONUS: you can add different colors if you want!*

**Answer:** Change drop down in pink block to read repeat "4" times. Change drop down in blue line to read turn right by "90" degrees. Students may use blocks on the left to add color if they want!

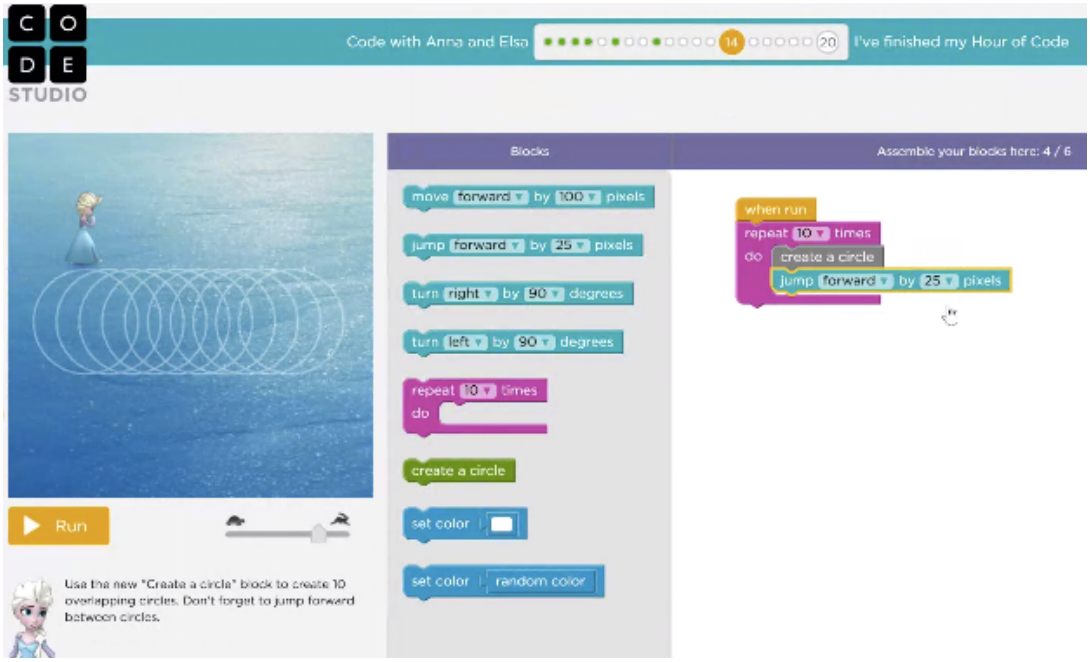



**PUZZLE #12** – *Create a snowflake using the repeat block to repeat the parallelogram 10 times, turning right by 36 degrees between each one. BONUS: add color blocks if you want!*

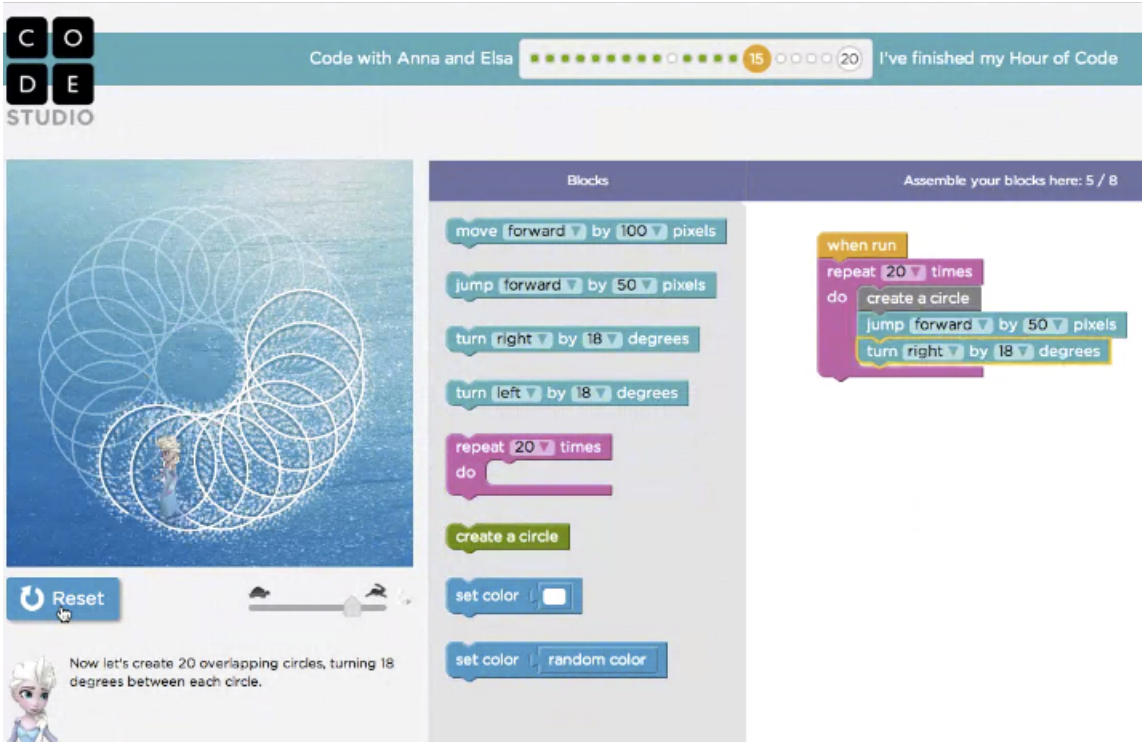
**Answer:** Move the pink repeat block underneath "when run". Drop the grey blocks and blue line inside of the pink block. Change drop down in the blue block to read turn right by "36" degrees.



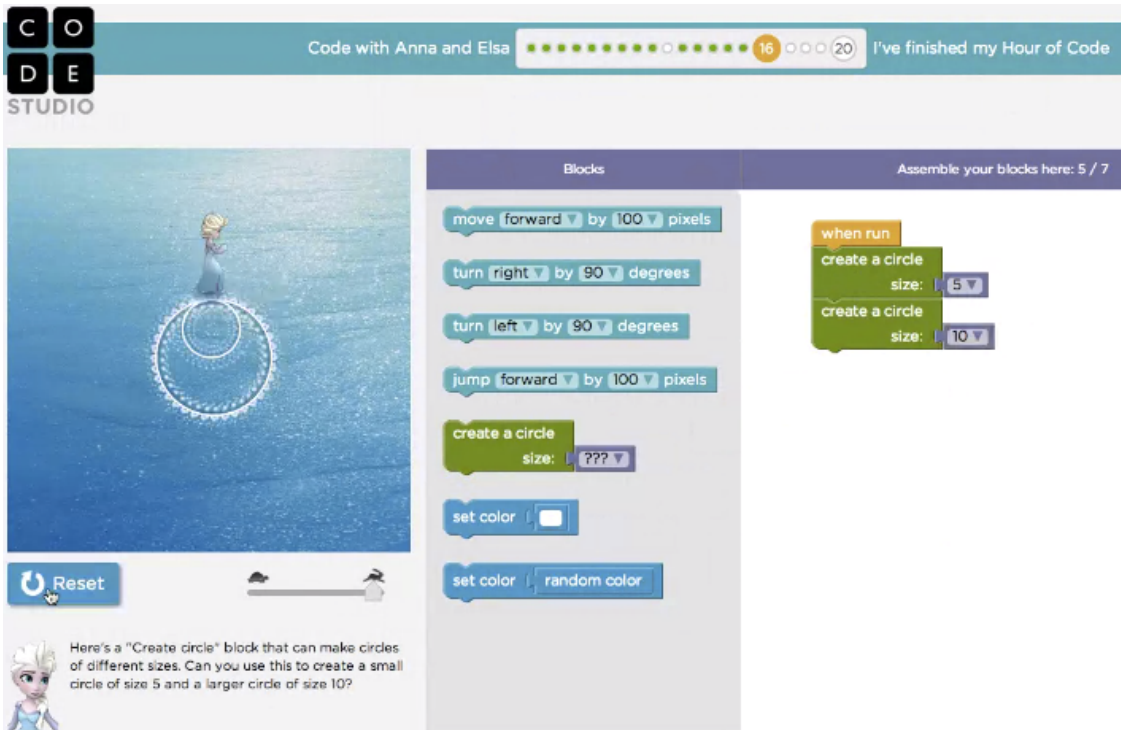

**PUZZLE #13** – *What number do you need to replace the question marks with to make a circle? BONUS: add color blocks if you want!*
**Answer:** From drop-down in pink repeat block, choose "360" times.



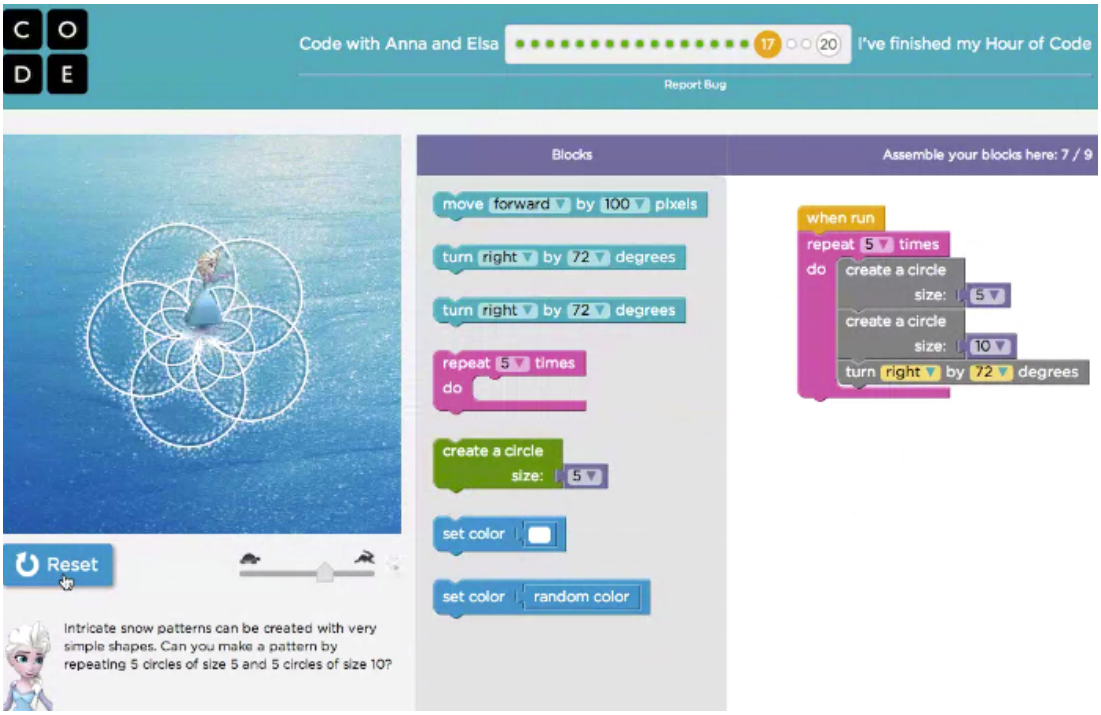

**PUZZLE #14** – *Use the "Create a circle" block to create 10 overlapping circles. Jump forward between the circles. BONUS: add color blocks if you want!*
**Answer:** Drop pink repeat block underneath "when run". Drop "create a circle" and blue "jump forward" blocks inside the pink repeat block. Change drop-down to say "jump forward by 25 pixels".



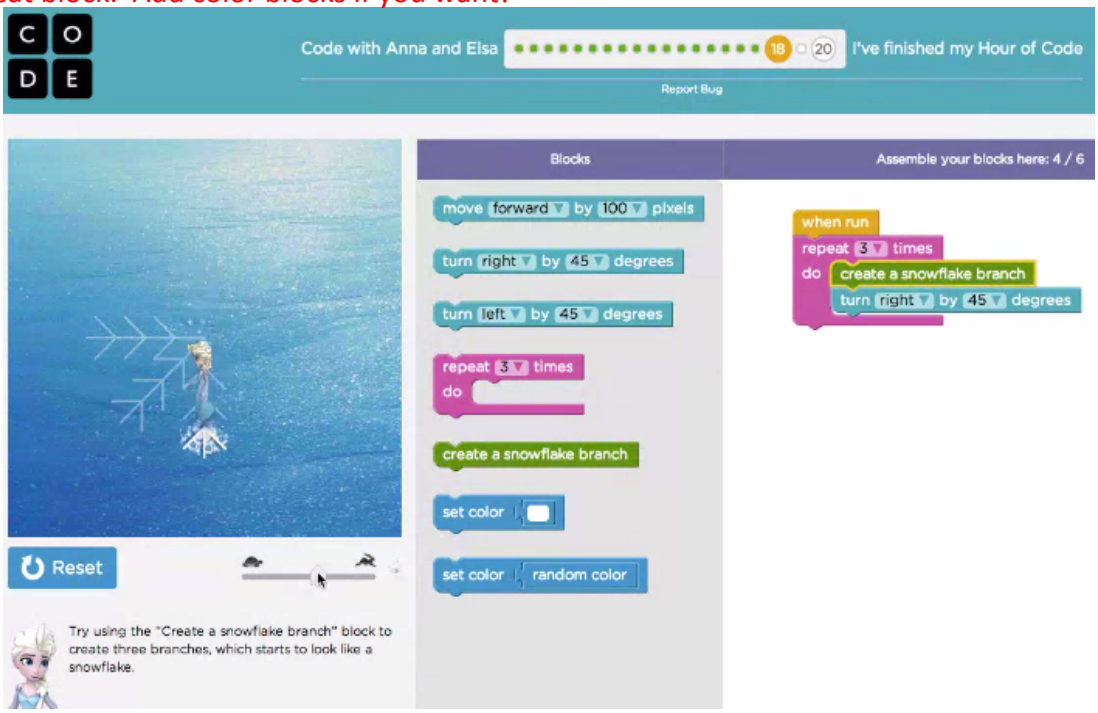

**PUZZLE #15** – *Create 20 overlapping circles, turning 18 degrees between each circle. BONUS: add color blocks if you want!*
**Answer:** Leave blocks as is. Choose repeat 20 times in pink block. Jump forward by 50 pixels. Turn right by 18 degrees.



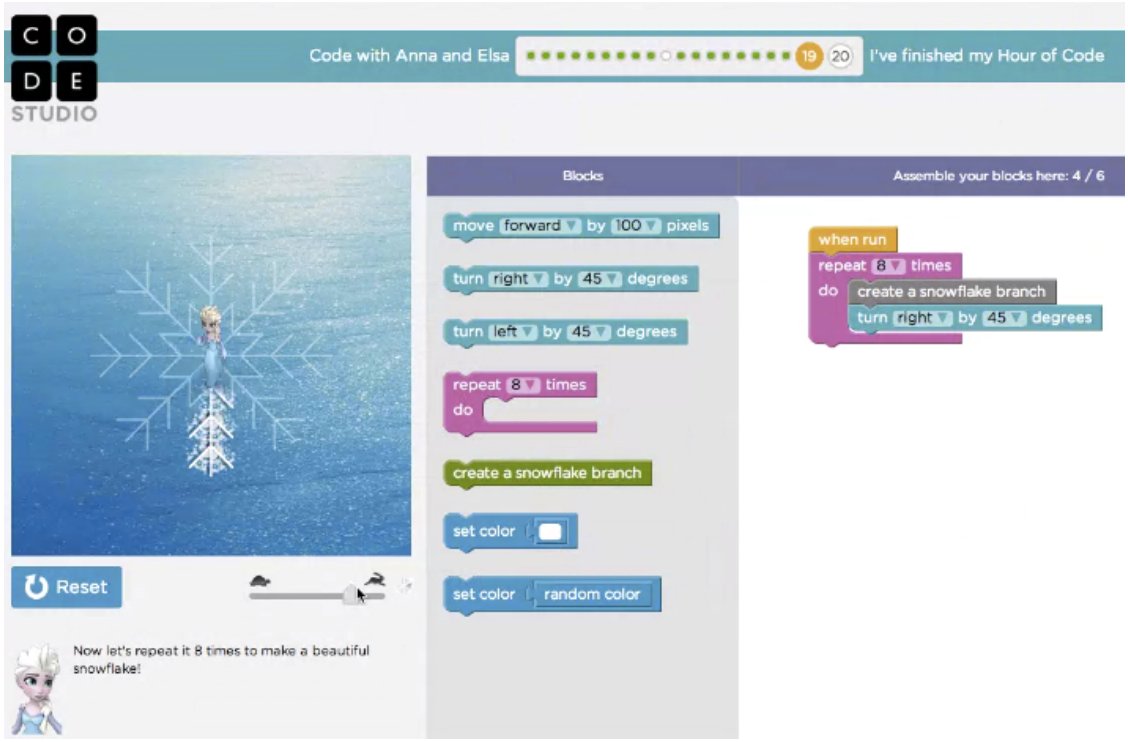

**PUZZLE #16 –** *Use the "Create a circle" block to make a small circle of size 5 and a large circle of size 10. BONUS: add color blocks if you want!*
**Answer:** Drop the "Create a circle" block 2 times under "when run". Change the size of one to "5" and the size of the other one to "10". It doesn't matter what order the circles are drawn.



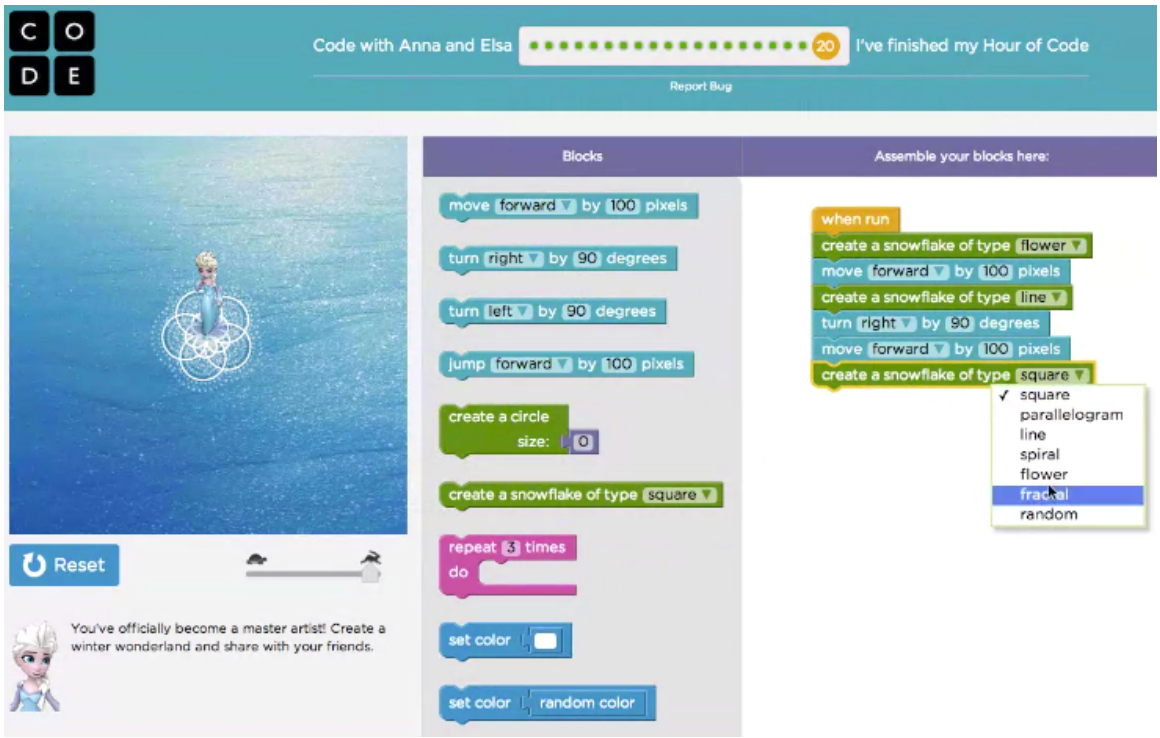

**PUZZLE #17**: *Make a pattern by repeating 5 circles of size 5 and 5 circles of size 10.*
**Answer:** Drop pink repeat block under "when run". Drop 2 x "Create a circle" blocks inside repeat block. Place "turn right by 72 degrees" block underneath the create a circle blocks inside pink repeat block. Add color blocks if you want!




**PUZZLE #18:** *Use the "Create a snowflake branch" to create 3 branches. Add color if you wan*t!
**Answer:** Drop pink repeat block underneath "when run". Make sure it says repeat 3 times. Put "create a snowflake branch inside repeat block. Drop "turn right by 45 degrees underneath "create a snowflake". Add color blocks if you want!




**PUZZLE #19** – *Repeat the snowflake branch 8 times to make a snowflake. Add color if you want!*
**Answer:** Drop pink repeat block underneath "when run". Drop "create a snowflake branch" and "turn right by 45 degrees" inside repeat block. Add color blocks to change color.




**PUZZLE #20 – Master Artist** – *Create what you want!*

# Information For Floaters / Teachers:

**What if there are tech issues?**

We will do one of the following "unplugged" tutorials – teachers and floaters, please familiarize yourself with these two activities just in case! (EACH LOCATION MAY DO SOMETHING DIFFERENT)

1. Graph Paper Programming: http://studio.code.org/s/course2/stage/1/puzzle/1
2. Real-Life Algorithms – Paper Planes: http://studio.code.org/s/course2/stage/2/puzzle/1

**Video overload:**

-If connectivity is limited, try changing the video resolution in the lower right corner to be non HD

-If issues persist with streaming, switch to the Show Notes tab in the video playback window. This provides the transcript for the videos so you can avoid streaming and still get the learning value.

**What tutorial will we be doing?**

The artist tutorial with Anna & Elsa: http://studio.code.org/s/frozen/

**What do we do if kids finish early?**

-Direct the kids to do the PlayLab Tutorial: http://studio.code.org/s/playlab/

-There are a lot of free play/creation at the end but if they finish with that they can move onto another tutorials on http://code.org/

**Teaching tips:**

- Most kids don't read instructions so if someone is stuck and needs help, please start by asking them to read out the instruction out loud and explain to you what it's asking for. That is usually enough to get them unstuck

-Encourage kids to try and experiment and **NOT** get attached to the idea of solving the puzzle on their first attempt. It's NOT a race.

-Mistakes are great and encouraged – that's how we all learn!

- Many kids get stuck on spatial orientation (turn right/turn left). The best way to teach this is to tell them to put themselves in the shoes of Anna or Elsa and see which direction they're facing and decide which way to turn from that perspective. Doing a short spatial orientation exercise by getting up and turning around really helps.

- Please don't explain more than is needed i.e. no need to explain pixels or angles or function in great detail - just focus on what they need to know to solve the puzzle

**Frozen Puzzles:**

- Are structured as distinct sets. Each set comprises one puzzle to create a simple shape (like a square or line), one puzzle to repeat it a small number of times to understand how repetition works, and one or two puzzles to repeat it many times to create a beautiful snowflake.

**Puzzles are generally of 3 types:**

- Puzzles where we want kids to drag blocks from the toolbox into the workspace and then run that code e.g. http://studio.code.org/s/frozen/stage/1/puzzle/1
- Puzzles where we already put code in the workspace (to help start them off) and kids are just supposed to change the ??? in one or more blocks already on the workspace. No additional blocks are required so there's no toolbox. e.g. http://studio.code.org/s/frozen/stage/1/puzzle/4
- Puzzles where we have starter code AND need kids to drag additional blocks to the workspace from the toolbox in order to complete the code to draw the required shape. e.g. http://studio.code.org/s/frozen/stage/1/puzzle/7

-Note: Puzzles will either fail or succeed. In the case of a failure (i.e. when the code does not create the required pattern), kids have to try again until they get the puzzle right.

-Puzzles can succeed with an ideal number count or a non-ideal block count (which means the code was good but not optimal) - in the latter, kids are using redundant blocks and are given the choice to try again and make their code more optimal.

-Puzzle 2 usually requires help in explaining how turning works. That's where physically spatial orientation really helps. Ask kids to get up and put themselves in Elsa or Anna's shoes and then decide which way to turn.

-Puzzle 7 usually confuses kids to put the repeat block below the grey blocks instead of putting the repeat block around the grey blocks to repeat them.

- Puzzle 10 is hard for little kids because they don't know the angles of a parallelogram. The angles are mentioned in the instruction so just asking them to read the instruction out loud does the trick.

- Puzzle 13: Younger kids don't know how many degrees are in a circle (360) so you might just need to tell them OR better, ask them to try the various options in the dropdown of the repeat block.

**Computers**

- In an effort to save computer batteries, we will not be turning on the computers until after Una Fox and Mike White have kicked off the event – login is ON the computers
- Go to the URL:  Code.org/frozen
- In the event that a computer is running low on battery, it will start beeping, we ask that a VoluntEAR teacher plug in the power (located at all tables)

**Video overload:**

- If connectivity is limited, try changing the video resolution in the lower right corner to be non HD
- If issues persist with streaming, switch to the Show Notes tab in the video playback window. This provides the transcript for the videos so you can avoid streaming and still get the learning value.

*Remember, encourage the kids – it's good to make mistakes, that's how we all learn!*