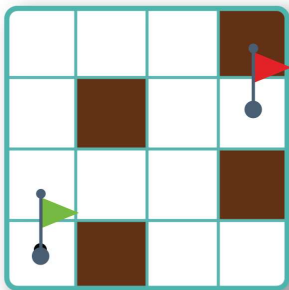# Sequencing

Info Sheet

WHAT IS SEQUENCING?

Simply put, sequencing is the order of things! When we talk to computers we have to talk in a way that makes sense to them. This means thinking about the right order of the steps and directions we give it. Sometimes thinking about sequencing seems rather obvious, but we must remember that computers can only understand what we tell them. So with this in mind, it is definitely OK to be obvious… in fact it's required!
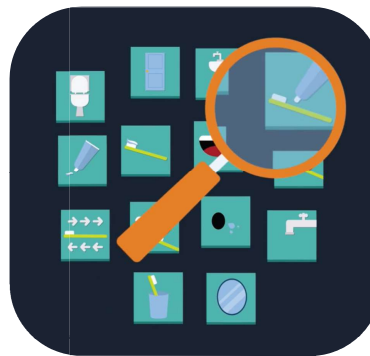
THE SEQUENCING VIDEO

The video uses three main examples of sequencing, or 'sequential thinking':

Example 1 (0:24) is a simple game. You just need to think about the steps (using left, right, up, or down) to get from the green flag to the red flag. However, it is important to point out that we need to think about all of the steps you need to take before you start! Thinking ahead about the full sequence is a skill programmers have to do all the time!

Examples 2 (1:19) & **3** (2:12) brings us into what (one would think) are simple real-life examples. Brushing your teeth! But why are we using such a simple example? Good question! Remember, a computer doesn't know anything about brushing teeth, so even the simplest of tasks need to be explained… and in the right order!

TAKE AWAYS:

- Sequencing is the order of things!
- Thinking ahead about the order of things is a common programming skill.
- Computers can only do what you tell them, so it's important to get the sequence right!

Activities

Activity 1: Minds On with Sequencing

The goal of this activity is for participants to understand that computers process information differently than humans do and why sequencing is so important! Inform participants that you are going to ask one of them to volunteer to complete a simple task, which can only be completed by following the exact instructions of the other participants or yourself. A great task to assign for this activity is to have your volunteer walk from one point in the room to another. However, tell the volunteer they must 'think like a computer' and have to follow the instructions EXACTLY as they are given. Have the other participants give their suggested instructions one at a time, or you can give them yourself. The volunteer will act out each instruction given.*

*You may find participants will suggest the volunteer walk before asking them to change direction, not saying how many steps they should take, or saying 'turn left' which will cause the volunteer to start spinning in a circle! If you are giving the instructions, try giving a combination of specific and vague instructions.

After the first attempt, revisit Example 1 from the video and remind students to think about all the steps needed before starting, and to be specific with their instructions! Have participants try the activity again using what they just learned. Once you have finished, remind everyone that computers can only understand what we tell them.

Activity 2: Action

Inform participants that for this activity they will imagine themselves as robots! Their bodies will now ask like computers. Explain that they will be programming their bodies according to a series of movements and actions. Present participants with the following sequence or 'code'. Ask for either a volunteer or the whole group to perform the movements. Let them know they will begin to perform the actions when you clap your hands.

Walk 4 steps forward
Turn 90° to the right
Clap your hands
Wait 2 seconds
Walk two steps backwards
Turn 90 ° to the left
Put your hands on your hips
Wait 2 seconds

Ask participants why they think this might be called sequencing?

Activities

Activity 2: Alternative

Ask participants to help you come up with the steps you need to complete an action similar to brushing your teeth. For example, getting dressed for school or making breakfast. Say that 'you've forgotten how and you need their help to remember how to do it!'. Have participants (either individually or in small groups) brainstorm the steps you need to complete this task. Have participants order the steps on their own or in their groups. Once that is complete, have all participants help you put them in the right order.

Activity 3: Consolidation

Allow participants (either individually or in pairs) time to develop their own sequence. The sequence can be recorded using any format of their choice. Have participants think of an action they perform every day (making cereal, getting ready for bed, etc) and have them choose one they'd like to work with. Explain that this action is what they will use to create their own sequence!

Give participants time to brainstorm the steps of the action and record them in the proper order. You can remind participants their actions should have a minimum of 4 steps. Allow students opportunities to share their codes with others, if situation and/or time permits. Collect the sequences and check that their steps are correct!

Song Lyrics

You gotta say the right steps from the start until it's done
If you don't it won't work and that's no fun!
It's called sequencing and it's the order of things
It's how we gotta talk when we talk to machines!

OK look right here we got a game made of squares
You got five moves to go from from here to there
You can move on the white squares not the brown
So what's the right sequence using left, right, up or down?

Are you ready? Give it a try
Go up, go up, go up, go right, go right
Go up, go right, go right, go down
Go up, go right, go right, go up, go right

Chorus

Let's think about brushing your teeth
What's the right steps when you brush those teeth?
Before you go to bed and say goodnight
There are four main steps, gotta get the sequence right

OK here we go let's give it a try
Alright I can do this.
Brush, rinse, open mouth, put toothpaste on
Put toothpaste on, rinse, brush, open mouth
Put toothpaste on, open mouth, brush, rinse

Chorus

You know what? Let's get more way more specific
Many other steps actually go with it
To brush your teeth proper got to know what to do
Let's go step by step, until it is through

OK give it a try. Be real specific for me now
First you: Find the bathroom
Then you: Open the door
Then you: Go to the sink
Then you: Get your toothbrush and the toothpaste
Then you: Put the toothpaste on the toothbrush
Then you: Then you open your mouth
Then you: Put the toothbrush in your mouth
Then you: Brush back and forth
Then you: Take the toothbrush out
Then you: Spit in the sink
Then you: Rinse your mouth and the toothbrush
Then you: Put the toothbrush back
Then you: Look at your clean teeth in the mirror and smile and say 'you are the best toothbrusher ever!'

Wow that's a lot of steps, there are so many
Double check to make sure you didn't miss any
Gotta tell the computer exactly what to do
Cuz if the sequence isnt right, it wont work for you!

Chorus