Repetition

- In many kinds of animations, especially simulation and games, some actions happen again and again
  - Example
    - Games where targets randomly appear and are caught or shot down, then appear elsewhere

- Actions are made to happen again and again by running an instruction or method more than once

Example

- Bunny sneaks into garden and wants to eat broccoli. Bunny needs to hop several times over to broccoli
Bunny.hop

• Makes bunny hop up and down, making a sound and traveling .8 meters total
• See code in book
• How do we get bunny to hop many times over to the broccoli?

Counted Loop

• A counted loop is an alternative way to write repetitive code
• Repeats instructions a counted number of times

One solution

• What is the problem with this solution?

Demo - Code to hop 6 times

• The loop instruction executes a definite number of times, specified by a count
• Using a loop instruction
  – Saves time
  – Is convenient, easy to change the count
  – Can use a function in place of the count (must return a number)
Infinity times….

• If “infinity times” is selected for a loop, loop will run until the program is shut down.

How do we fix this?

• How do we get both bunnies to move, one infinitely and one definitely?

• NOTE: Be Very Careful when using infinite loop! If something goes forever, it doesn’t stop!

Example

• What happens if we make the other bunny hop up and down infinity times?

More Complicated Loops

• It is possible to place a loop within another loop statement, this is nested loops.
• Example in book: double ferris wheel.
Problem

• Given a cow that can randomly appear and disappear.
• Want to add a score to count the number of times user clicks on the cow.
• User gets specified amount of time to click (timer).
• Cow stops moving when time is up.
• User wins if a target number of clicks is achieved in the specified time. Cow tells user if they won or not.

Start classwork now and I’ll show how to do the score

Solution

• Add a new 3D text object
  – will keep track of times cow clicked on
  – type in “score,” as the name of the 3D text object
  – Then change its text value to 0

Review: What is a Variable?

• Property that can be changed using set
  
Drag isShowing tile into editor and select new value false
Add Mutable Variables

- What does Score need to keep track of?
  - current value
  - final value
  - increment value
- Add three mutable class variables

Increment Counter

- Add an event to increment score's value when mouse is clicked on cow
- Need to write a method to increase the score value
  - both variable and text displaying score must be changed
Second, display the new text value

- Each 3D text has a text value
- Drag this field and set
- A world built-in function can be used to display the number value as a string

Almost Done…

- Add another 3D text to just say the word score
  - I named it scoreText
  - Then changed text value to “score”
- Add code to repeat until target is reached
- Cow appears at end

ClassWork

- Start with ClickACow.a2w
- Add a Score
- Add a Timer – similar to score
  - Start at high value (say 20)
  - Count down instead
- Game is over when Timer runs down
  - If Target score is reached – you win