



Coin Toss Probability Activity

with



lynxcoding.club

With funding from

Canada

CODEtoLEARN.ca

TakingITGlobal
INSPIRE INFORM INVOLVE
INSPIRER INFORMER ENGAGER

DESCRIPTION

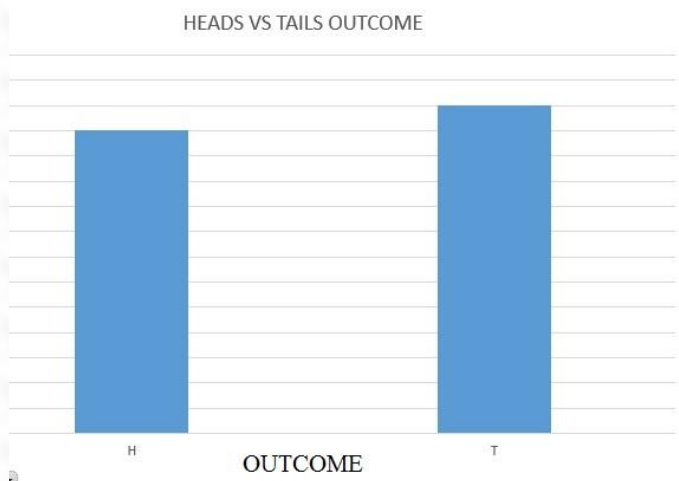
Overview and Learning Goals

DESCRIPTION

Probability Task: Flipping a Coin

Students (grades 4-8) will code an investigation to see how trial size impacts the probability of an event.

Students will code this activity using Lynx at lynxcoding.club.



Students will code the computer to:

- Randomly choose an event
- Set the number of trials for an investigation
- Keep track of how many times an event occurs
- Create a graph using the data

Success Criteria

Co-construct success criteria with your students.

LEARNING GOALS

Students will learn, and use, these...

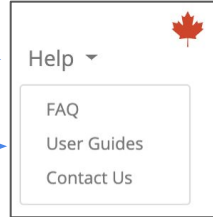
<i>BIG IDEAS IN CODING</i>		
	<i>MAIN IDEAS</i>	
<i>CODE & CONCEPTS</i>	<i>pick</i> <i>Randomly select an option listed</i>	<i>setshape, setcolour</i> <i>Manage object characteristics</i>
	<i>Slider</i> <i>A variable controlled by the user</i>	<i>setpos</i> <i>Manage the location of a turtle</i>
	<i>Buttons</i> <i>To use the code written</i>	<i>Pages</i> <i>Multiple work areas for different codes</i>

GETTING STARTED

Get a LYNX Account and Understand the Layout

Get a Lynx Account

Details at lynxcoding.club



We suggest:

- teacher gets a **School Administrator Account**
- students get **permanent Individual Accounts**
- teacher creates a **'club'** and invites all students

NO Account

You can try Lynx for free without an account, by clicking on **Create a Lynx Project** on the home page at lynxcoding.club.

FREE TRIAL Account

For full access, register (click **Login/Register** located at the top, right side of the Lynx web page).

INDIVIDUAL Account

Convert your trial account to a permanent individual account before end of trial period.

SCHOOL ADMINISTRATOR Account

Convert your trial account to a School Administrator account before end of trial period.

Accounts are free for Canadians thanks to a subsidy by the Government of Canada.

Layout

Share

Save

Add Objects

Files

Procedures

Clipart

Project Tree

Settings

My Projects

Commands

Help

My project - page1

Procedures

```
1 ; This is an example of a procedure. Type the  
   word DrawSquare in the Command Centre (the  
   area below the white Work Area)  
2  
3 to DrawSquare  
4 pendown  
5 repeat 4 [  
6   forward 100  
7   right 90  
8 ]  
9 end  
10
```

Procedure
Pane

Clipart
Pane

Name your
Project

Turtle

Work Area
(Page)

Command
Centre

HELP!

Steps for Students

The BIG Picture!

Log In and create a new project!
Immediately name it and **SAVE OFTEN.**

Create a title page for your investigation. In total, you will have 3 pages!

Create an interactive button to flip your coin!

Create a slider to determine how many trials your investigation is going to run!

Set a graph background!

Add a new turtle and set positions!

Create a bar graph using your data!

Make public and share your investigation!

Log in and Get Started!

Log in, Create a new project,
NAME it and SAVE it.

START IN THE RIGHT PLACE!

Go to the “My Projects” tab

After logging in, click on “My Projects”.

Create a **new project** by clicking “Create a Lynx Project”

Name your project!

Save your project immediately after naming it! There is NO autosave.



Use this icon to save your project regularly!



Adding Clipart

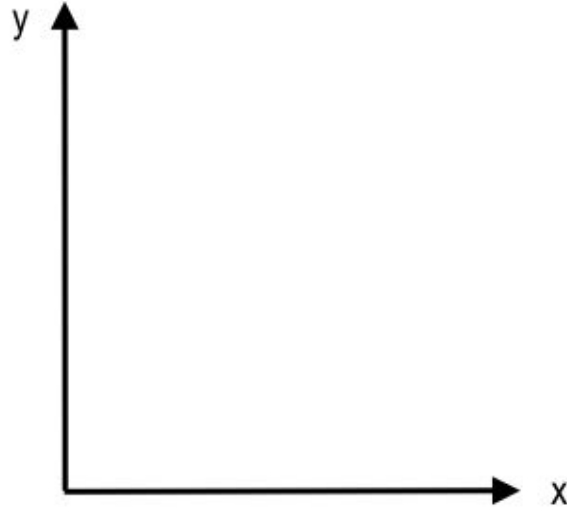
Add clipart to your project!

Add Clipart

1) Google the images you want to use. For this activity, find a heads and tails image of the same coin. Also find a simple graphing axis you want to use. These 3 images are to the right.

2) To upload your clipart, click the house icon on the left side of the screen. Click on the bottom right of an empty box to see the “+” icon. Upload your images into each box.

3) Upload the “heads” coin in the first empty box, the “tails” coin in the second empty box, and the graph in the third empty box.

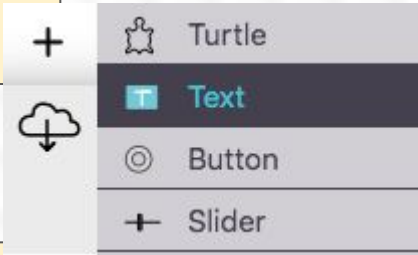


Create a Title Page

**Insert a textbox and buttons
to move through your code!**

Creating a Title Page

1) Click on the “+” on the left side of your screen and select **text**. A text box will appear in the work area. Move it anywhere by dragging it by its name. Click inside the text box and create any title you choose!



2) Create two **buttons** using the same method (click the “+” and select the **button** option)

3) Rename one button “Flipping a Coin” and the other button “Graphing”

To rename, right click on the button and change the label!

4) Go to the **Procedures** pane and write the code to move from one page to another as shown in the blue box!

For the first button:

```
to pagetwo  
  page2  
end
```

For the second button:

```
to pagethree  
  page3  
end
```

5) Right click on each button and change the “**on click**” drop down option to match the code you wrote!

Optional: Add a Background to the Title Page

1) Add an image that you'd like to use as your background to your clip art! You need a turtle on the page first! Click on the "+" on the left side of your screen and select **turtle**.

2) Write the code in order to create your background

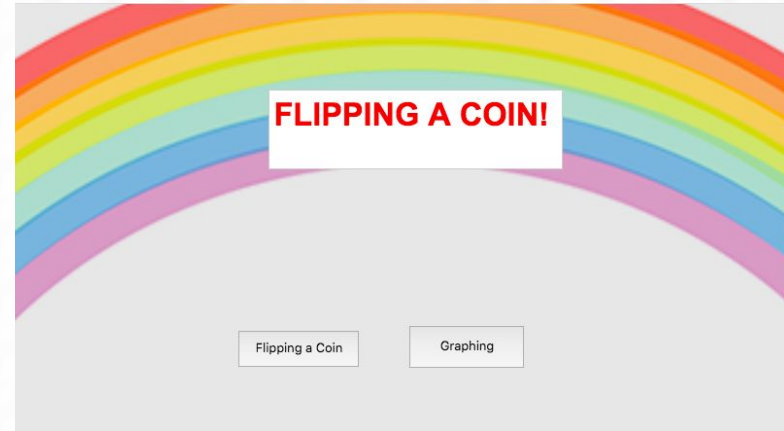
```
to changebg  
  setshape 4  
  setsize 100  
  stamp  
end
```

The "4" represents whichever empty clipart box you've put your background in!

The "100" represents how big the shape will be!

3) To use your code, right click on your turtle and use the drop down menu that says "on click" and choose the "changebg" code!

Example:

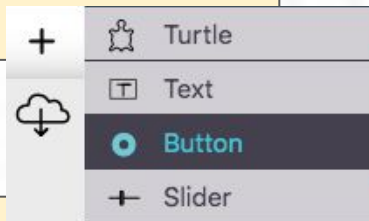


Flip Your Coin!

Create code to flip your coin

Flip Your Coin

1) Create a **button** using the “+” icon on the left side of your screen.
Rename the button “Flip My Coin”



2) Create a **slider** to set how many trials are done. Using the same “+” button, select the **slider** option. Right click on the slider to change its name to “**#flips**” and choose the maximum amount of trials allowed.

3) Create two **text boxes** to record how many heads and how many tails you get! Rename one text box “**#heads**” and one “**#tails**” In each text box, enter the number “0”.

4) Write the code for your button in the procedures pane!

```
to flipcoin
  repeat #flips [run pick [heads tails]]
end
```

**We have to set what
“heads” and “tails”
means to the code!**

```
to heads
  setsh 1
  set#heads #heads + 1
end
```

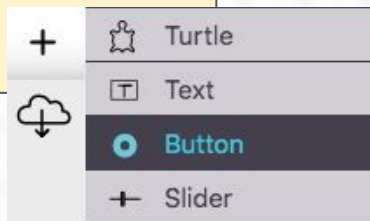
```
to tails
  setsh 2
  set#tails #tails + 1
end
```

setsh will change
the shape of the
turtle to the
clipart you
uploaded!

Reset Your Results

1) Create a **button** using the “+” icon on the left side.

Rename the button “Reset”



2) Write the code for your button!

```
to reset  
  set#heads 0  
  set#tails 0  
end
```

3) Be creative! Move your buttons and text boxes where you would like them to remain. You can choose to add a background to the page if you'd like as well.

If you add a background, make sure you add a new turtle!

Example:



Graph Your Results!

Use your results to graph the
number of heads and tails!

Start with Resetting!

1) Create a new **page** using the “+” icon on the left side of your screen..

2) On this page, create a new **button** and rename this button “**reset**”

3) Add two new **turtles** on this new page. Add the turtles by using the “+” icon on the left side. Be sure to check the turtles names!

4) Write the **code** for your button!

Shape 3 should be your simple graph!

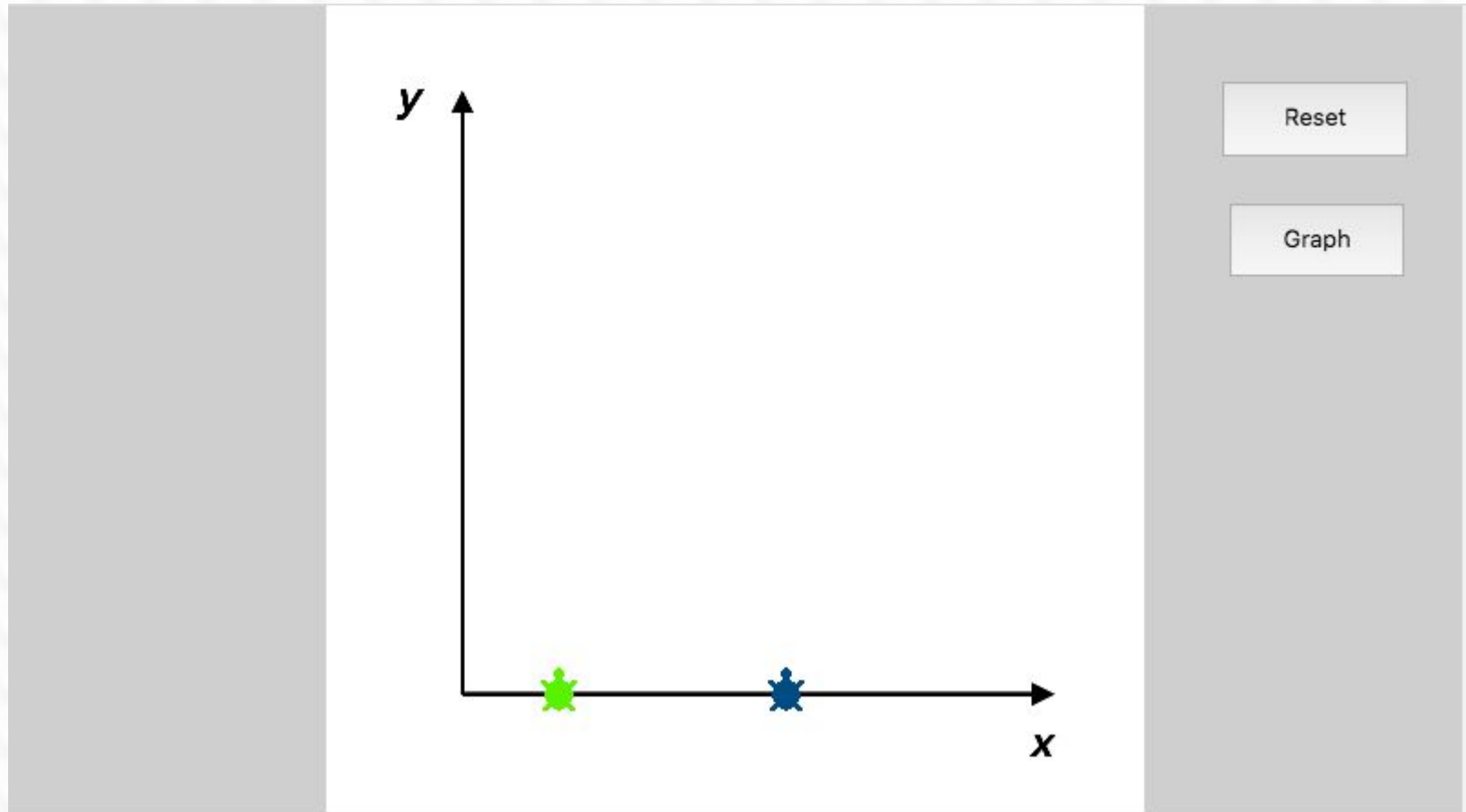
Check your turtle names and adjust the code if needed!

setpos will set the position of the turtle. These coordinates should bring you to the x-axis (see example on the next page)

After the setcolour primitive, you can assign any number from 0 to 139 to change the turtles colour! Check the Lynx Colour Chart in the Help-User Guides section

```
to resetsecond
  cleargraphics
  t3, home
  t3, setshape 3
  t3, stamp
  t3, setshape 0
  t3, setpos [-97, -157]
  t3, setcolour 54
  t4, setpos [28, -157]
  t4, setcolour 99
end
```

Example of a Reset Screen

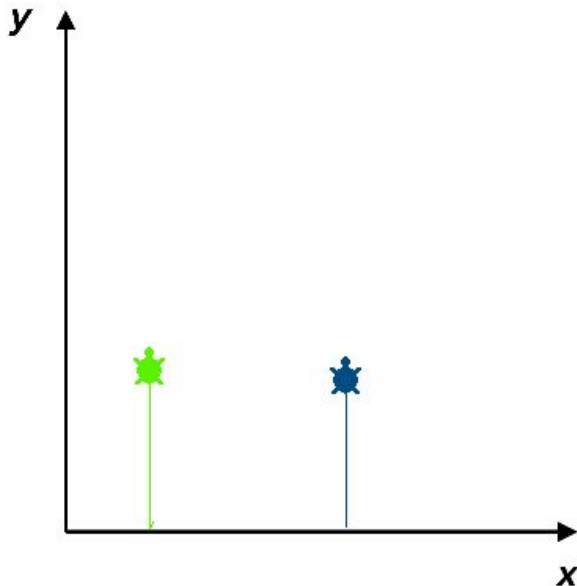


Graphing Graphing Graphing!

1) Create a **button** using the “+” icon on the left side of the procedure panel. Rename the button “graph”

2) In the Procedures pane, write the **code** for your button!

Example:



```
to graph
  ask [t3 t4] [pendown]
  t3, forward #heads
  t4, forward #tails
  ask [t3 t4] [penup]
end
```

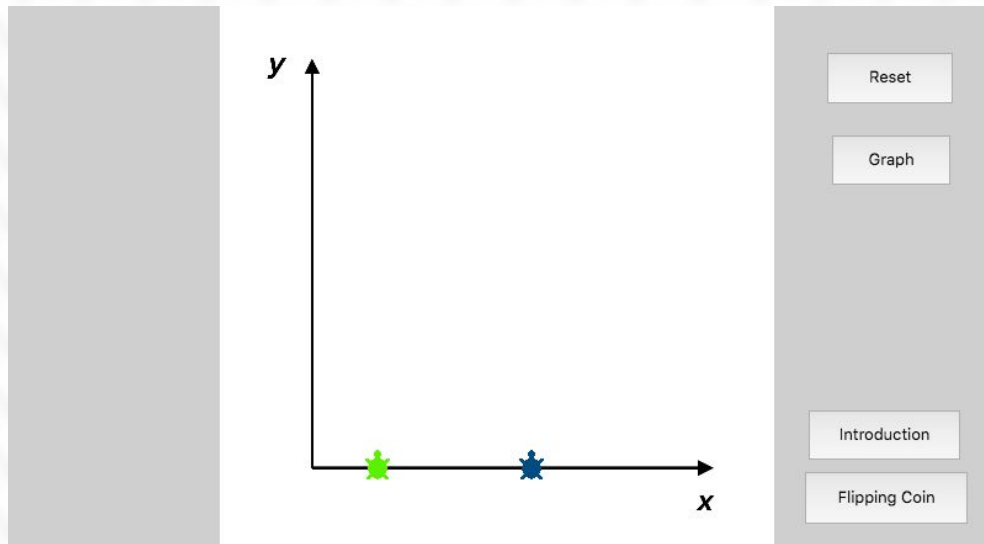
Create Buttons!

Create buttons to move
between pages!

Buttons Between Pages

1) Create **buttons** using the “+” icon on the left side. Rename the buttons to identify which page the button will take the user to!

Example:



2) Write the code for your buttons!

Each button should look similar to this code!

Introduction Button:

```
to pageone  
    page1  
end
```

Flipping Coin Button:

```
to pagetwo  
    page2  
end
```

Graphing Button:

```
to pagethree  
    page3  
end
```


Play Around!

Enjoy your investigation
and share with others!

Investigate!

Use the code you wrote to see the different number of events that happen when you increase and decrease the number of trials (i.e. how many times the coin is flipped)!

Look at the code of your classmates to see if you both set the same number of trials, do you get the same number of heads and tails?



Share Your Project

Send your project to friends or publish it!

1) Click the **Share** icon



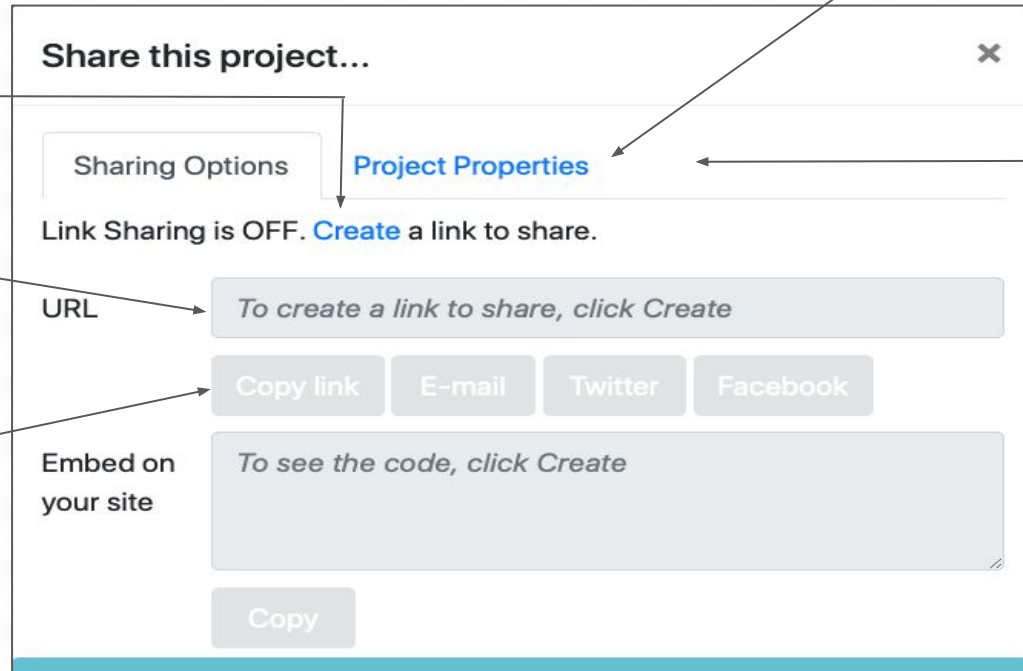
2) Click **Create**

3) A URL will be generated here!

4) Click the **Copy Link** and send it to friends!

5) Add a **Preview Image** to give your project a visual identifier

6) Will you allow others to modify your code? Don't worry, your original will remain!

A screenshot of a 'Share this project...' dialog box. The dialog has a title bar with a close button (X). It contains two tabs: 'Sharing Options' and 'Project Properties'. The 'Project Properties' tab is selected. Below the tabs, it says 'Link Sharing is OFF. Create a link to share.' There is a section labeled 'URL' with a text area containing the text 'To create a link to share, click Create'. Below this are four buttons: 'Copy link', 'E-mail', 'Twitter', and 'Facebook'. There is another section labeled 'Embed on your site' with a text area containing the text 'To see the code, click Create' and a 'Copy' button at the bottom.

CODEtoLEARN

Credits

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Inspiration from: MicroWorlds EX Coin Flipper Tutorial

Partners



A program of



Connected North

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