**Take Home Sheet 1, 08-OCTOBER-2025**

For students: Activities to read and try out this week. Feel free to invite your parents to follow along. No grades, no stress: Just some fun reinforcement as we learn Python and explore ideas from math, science, engineering and art.

**First activity:** Predict out loud what these little bits of Python code will do. Bonus: Run them to test your predictions.

**print(’harmony world’)**

**s = ’whirled peas’**

**print(s)**

**for c in ’abcdefg’:**

**print(c)**

**for c in [1, 3, 5, 7, 9]:**

**print(c+1)**

**a = 4**

**b = 5**

**c = 6**

**a = b**

**b = c**

**c = a**

**print(a, b, c)**

**# this comment is written in English**

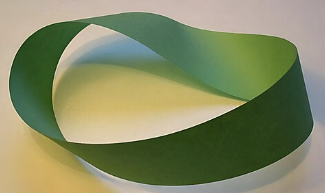
**# this comment tries to print hello: print(’hello’)**

**a = 2**

**b = 3.2**

**print(a \* b)**

**Second activity:** Here is a picture of a Mobius strip. To make one: Take a strip of paper, give it a half-twist, and glue or tape the ends together to make this twisty loop.



If you pinch somewhere on the Mobius strip: Your fingers tell you it has two sides. If an ant walks along the mobius strip: How many sides will she say it has? How many edges?

To predict and then experiment: If you were to make **a slice in the center of the Mobius strip** (parallel to the edges); and then if you use scissors to cut all the way around its length: What will be the result? One loop? Two loops? Thinner Mobius strips? Interlocking? Something else???

Same question if you make the slice 1/3rd of the way across the width of the Mobius strip rather than ½ way; then continue this cut parallel to the nearby edge. What will be the end result?

**Third activity:** Farmer Diophantus has $100 and wants to buy exactly 100 animals for his farm. He must buy at least one **cow**, one **pig** and one **chicken**. Cows cost $10 each, pigs cost $3, and chickens cost $0.50. He must spend exactly $100… is this possible?

**Fourth activity:** You and your friend have a large supply of poker chips: Small circular disks all the same size. You have a large circular table at hand; and so your friend suggests playing a game: **You clear the table and then take turns placing poker chips one at a time.** The chips must be placed flat on the table; no stacking them, no leaning them; just place them flat on the table. The first player who has no place on the table to put their next poker chip loses. Your friend asks you if you want to go first or second. What strategy is sure to win? (You can place chips on the table with perfect precision.)

**Fifth activity:** Turtle time! If you have Turtle graphics available you can proceed to the code below. If you need a sandbox to code in: Go to <https://www.pythonsandbox.com/turtle>.

This code draws a picture. See if you can draw it: A *prediction*. Then run this code!

**from turtle import Turtle**

**t = Turtle()**

**t.forward(100)**

**t.left(90)**

**t.pencolor(’red’)**

**t.forward(200)**

**t.home()**

**t.pencolor(’blue’)**

**t.left(90)**

**t.forward(200)**

**t.left(90)**

**t.up()**

**t.forward(30)**

**t.dot()**

**t.home()**