



Computational Thinking

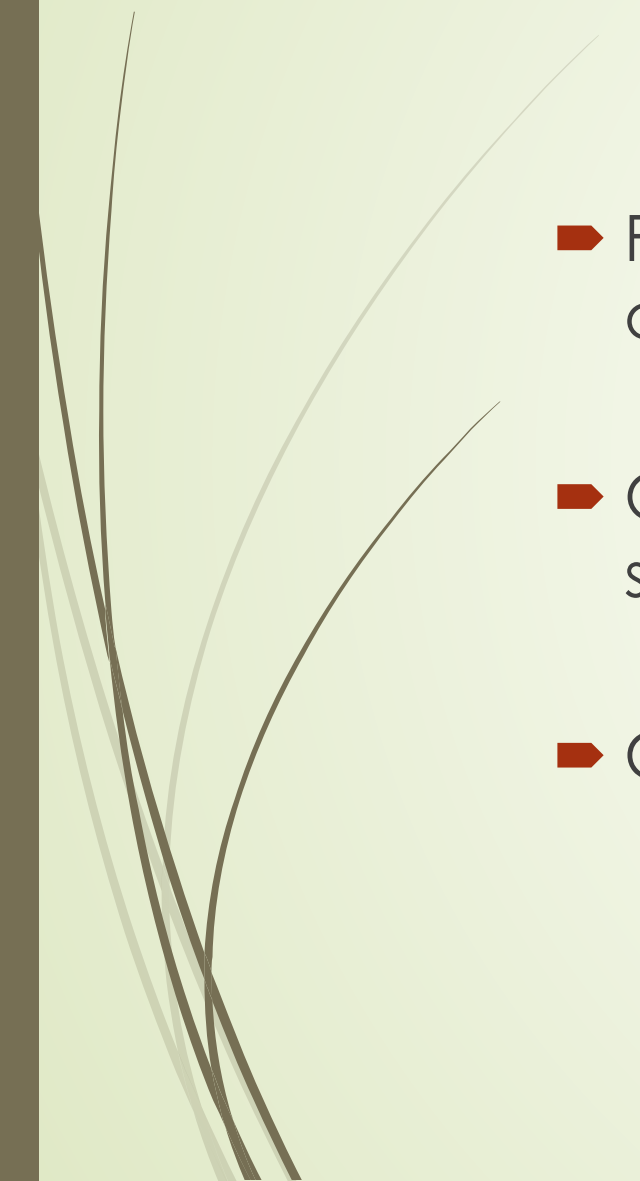
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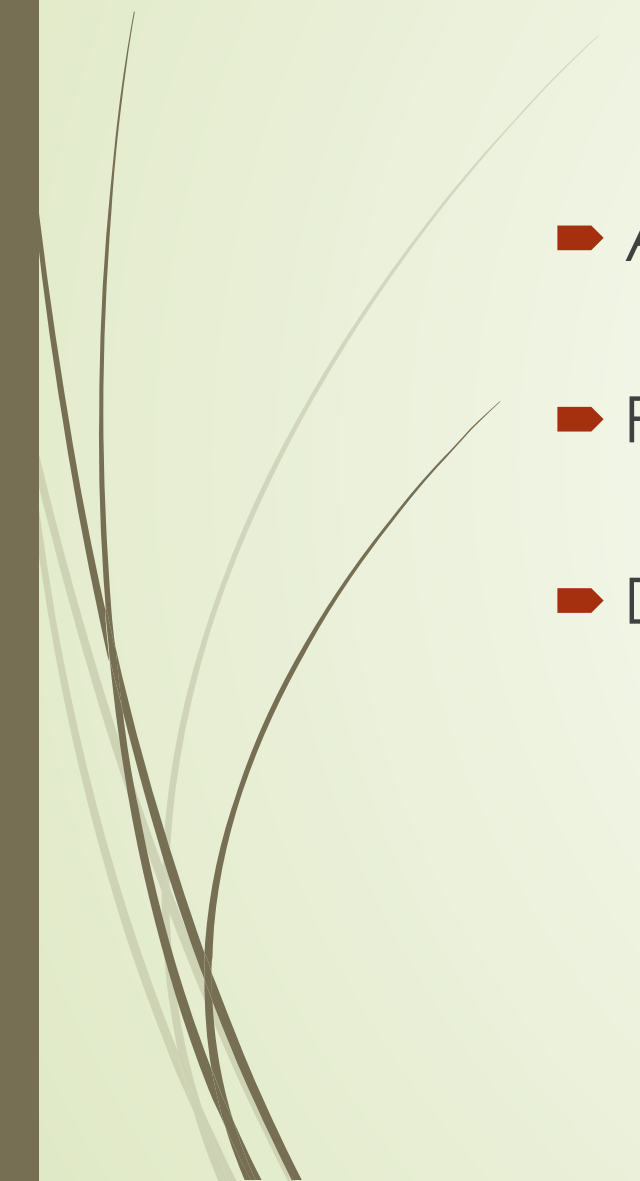
What is computational thinking?

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- Formulating a problem so that the solution can be obtained by computational means
 - Often accesses data (a large amount) as input to the solution
 - Choice and design of algorithms for a solution is important

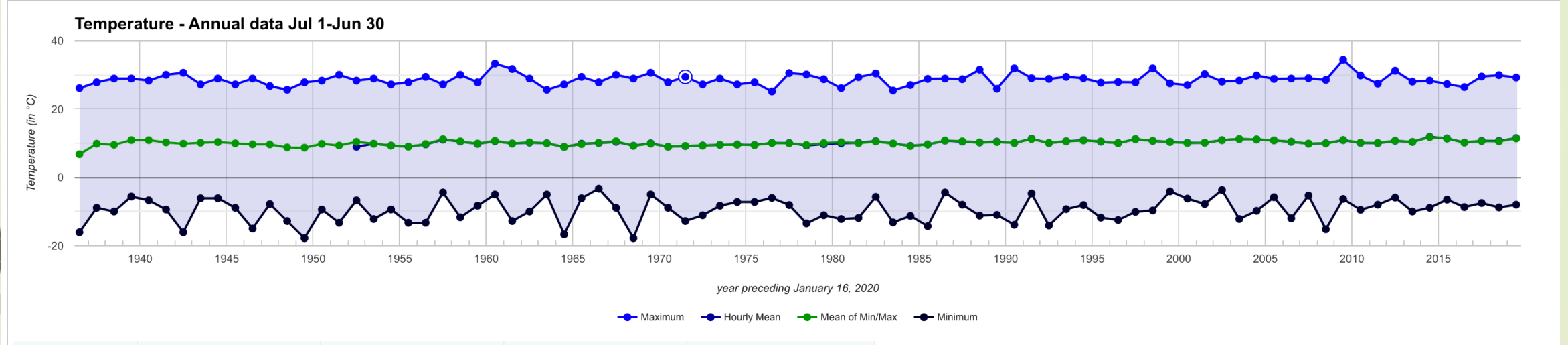


Example –

Can we see global warming?

- ▶ Access some data: Vancouver weather records
 - ▶ Plot it, do we see the evidence?
 - ▶ Dive deeper, use computational methods to see trends
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Vancouver temperatures: 1935 - 2020

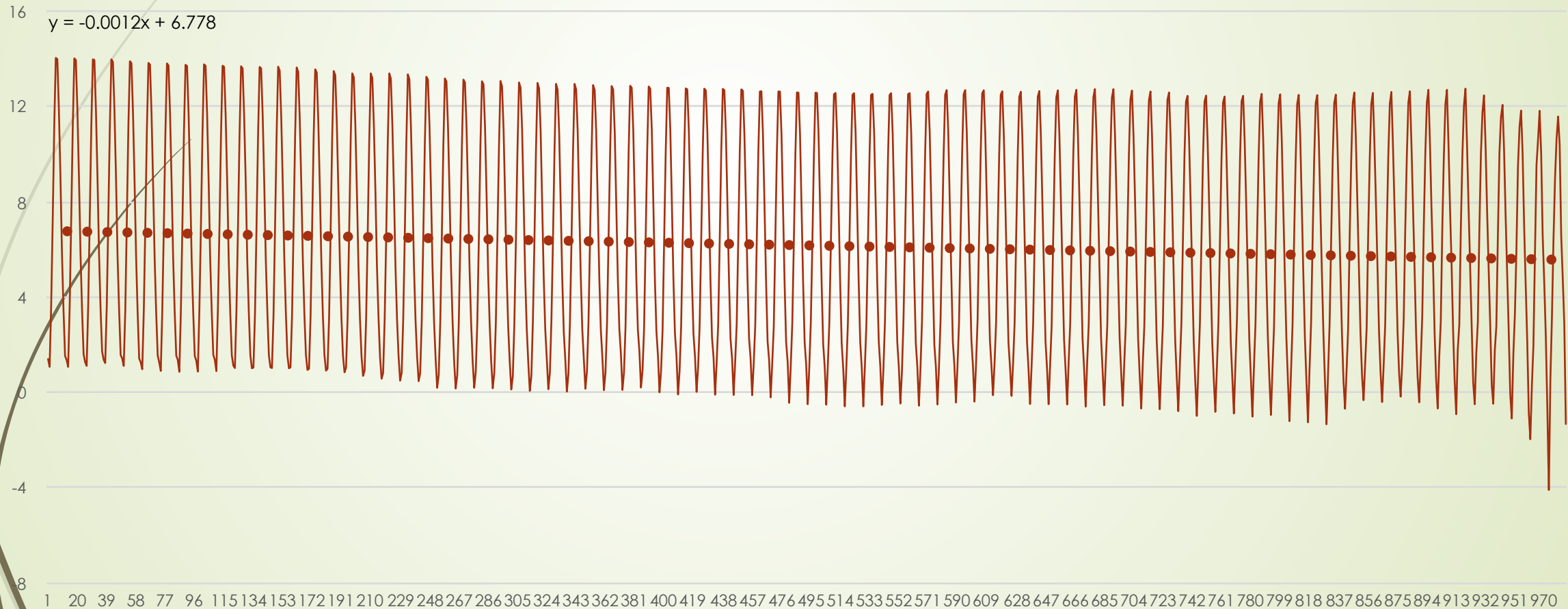


Grab the numbers, and analyze

date		max_temperature_v		min_temperature_v	
2020-01-01		6.86		1.4	
2019-12-01		6.44		1.07	
2019-11-01		9.38		3.63	
2019-10-01		13.62		7.23	
2019-09-01		19.04		11.2	
2019-08-01		22.39		14.04	
2019-07-01		22.45		13.99	
2019-06-01		19.71		11.88	
2019-05-01		16.98		9.1	
2019-04-01		13.26		5.82	
2019-03-01		10.19		3.45	


Trends in Monthly Min Temperatures

Monthly Min Temperatures (2020 ---> 1938)





Trend line $y = 0.00123x + 6.778$

- ▶ X is measure in months, so temp is rising at .00123 degrees per month
 - ▶ $.00123 \times 12 \times 100 = 1.5$ degrees per century.
- 



Summary



- ▶ Computational thinking:
 - ▶ We used available data to look for trends in temperature.
 - ▶ We used computational tools to put a number to the average increases.
- ▶ Going further:
 - ▶ Can we apply this to more data, from more cities around the world? To other projects?



Tools for teaching CT



Social Studies/Math 5+: Salish Baskets

Explore geometric motifs and patterns while learning about traditional basket weaving of the Tla'amin Nation. In the first notebook, students will be able to create their own motif, and in the second, they can display it in a 3D model. ***Click on "binder_init.ipynb" notebook to start and follow the instructions.***



Science 9: Incorporating Live Water Treatment Readings

In this science lab, students are asked to measure and record the conductivity of different solutions and are able to compare their results with live readings from the local water treatment plant.



English Language Arts 10-12: Shakespeare and Statistics

Students will import the classic Shakespearean texts Macbeth and Hamlet, and perform a statistical analysis of proper nouns in each.

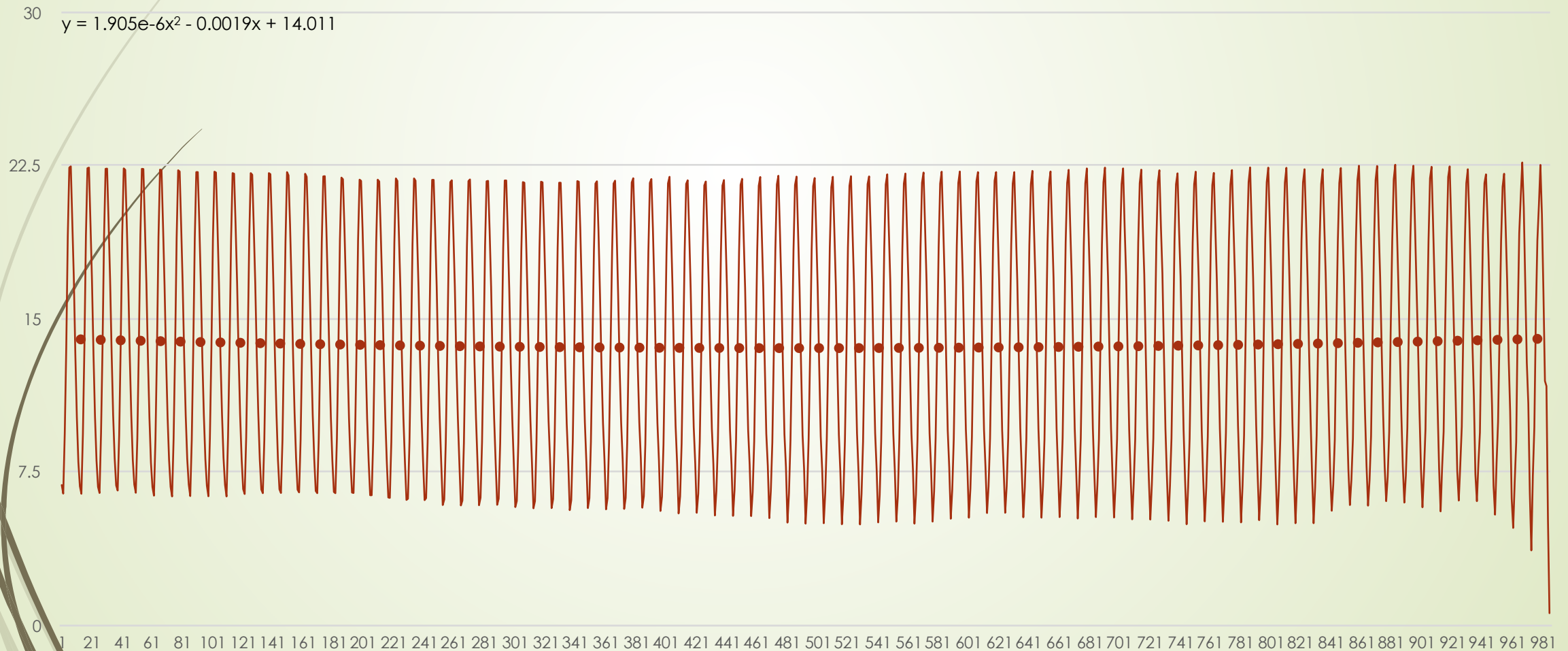


Thank you !



Quadratic trend show the increase

Max Monthly Temperatures (2020 ---> 1938)



Trends in Monthly Max temperatures

