Ucla

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Quantum Art!

Teacher Introductions

WARM-UP

BINGO!

Find new friends that fit the descriptions on your bingo sheets!

Lesson 1: What is a Quantum Computer?

Quantum Art

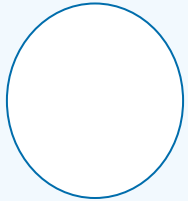
What is a computer?

Try thinking about how you use computers in your life.

Starter activity

Computer: a device that takes input data, changes it, and outputs new data.

COMPUTER BIT



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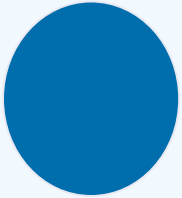

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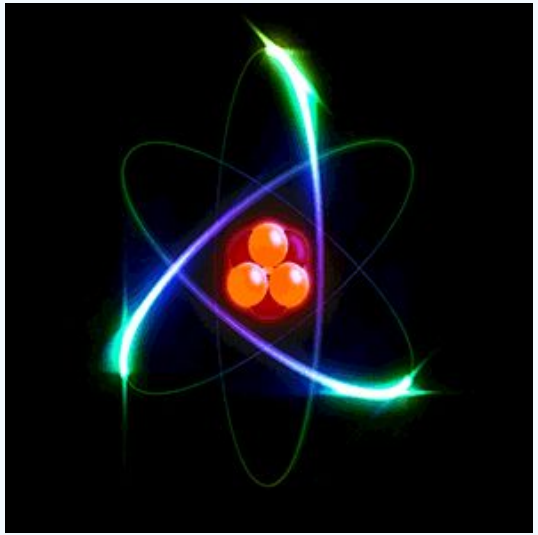
What is quantum?

This question is a little bit harder, right?



Lesson 1: What is Quantum Computing?

In this lesson, you will:

- Describe the difference between the computers we use in everyday life and quantum computers
- Identify basic principles of quantum computing
- Create art with quantum circuits

What happens when we examine the smallest building blocks of life?

SUPERPOSITION

SUPERPOSITION

the quality of being in multiple states until measurement

ENTANGLEMENT

VOLUNTEERS PLEASE!!

ENTANGLEMENT

a special link between two tiny particles. no matter how far apart they are, if you know what's happening to one, you instantly know what's happening to the other

What is a quantum computer?

What is a quantum computer?

A computer that uses

- Superposition
- Entanglement

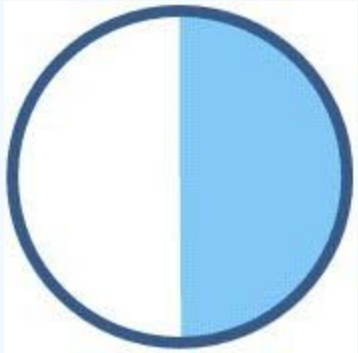
What does it mean if quantum computers use the same principles as the building blocks of life?

What is a quantum computer?

Quantum bit or qubit

Superposition of the two possible states |0> and |1>

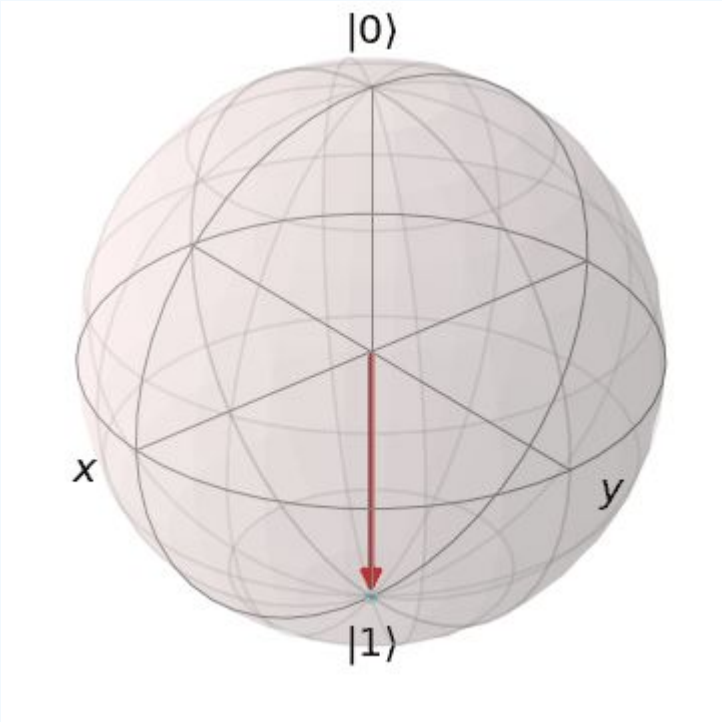
Qubit



Mathematically, it is represented as the probability of being in the |0> state and |1> state at the same time

Qubit = P|0> + P|1>

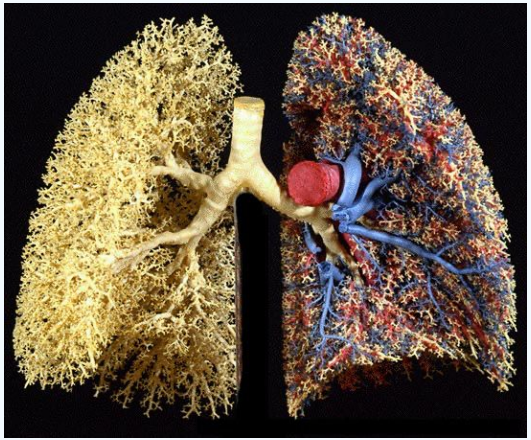
Qubit



Qubit = P|0> + P|1>

How do quantum computers relate to fractal art?

Fractals



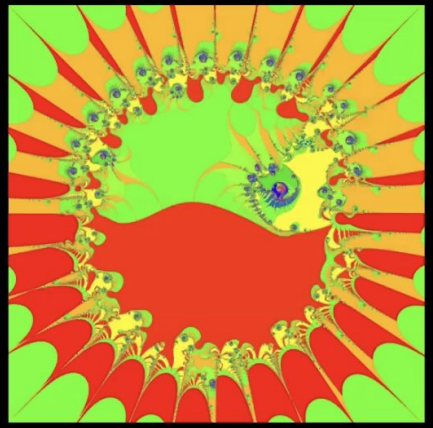
Fractals are repeated geometric patterns

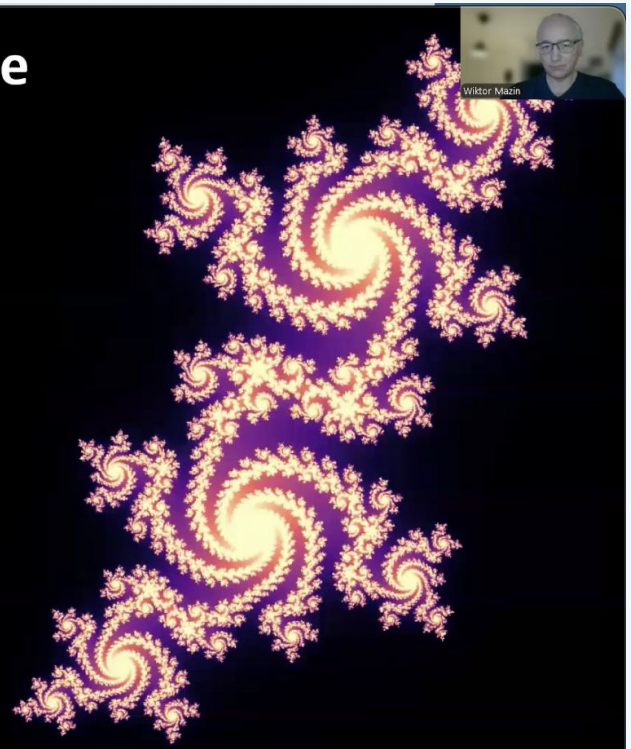
They occur naturally in our world and create shapes of great beauty and complexity

Fractals can be used to represent changes to a qubit in a quantum circuit

Artist Presentation: Dr. Wiktor Mazin

Quantum Fractals: Revealing the Unseen Beauty of Quantum





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Now, it's YOUR TURN!

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Project Share

🤔 Now, take a moment to submit your fractal with your name and quantum circuit

https://docs.google.com/presentation/d/1Wm_HDrQumPTl6jMGZIw3EjxgMoH8JK6GATxYWKCInNA/edit?usp=sharing

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WORKSHOP SURVEY

Workshop Survey

Please take a moment and complete the survey for this Workshop.