

CT_1

ct1

Training Clarusway

Pear Deck - July 6, 2022 at 7:02PM

Part 1 - Summary

Use this space to summarize your thoughts on the lesson

Part 2 - Responses

Slide 1



Use this space to take notes:

Slide 2

Your Response

Were you able to finish pre-class work for Computational Thinking?



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 Students choose an option

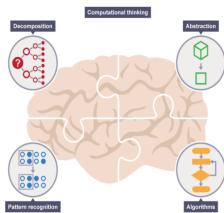
Use this space to take notes:

Slide 3

Today's Topics ➔

- ▶ What is Computational Thinking?
- ▶ Decomposition
- ▶ Pattern Recognition
- ▶ Abstraction
- ▶ Algorithms

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Use this space to take notes:

Slide 4

Your Response

Slide 4	Your Response
<p>▶ What is Computational Thinking? ➔</p> <p>Let's try to predict and discuss!</p>  <p><small>Peer Deck Interactive Slide Do not copy this slide</small></p>	

Use this space to take notes:

Slide 5	
<p>▶ What is Computational Thinking? ➔</p> <p>Computational thinking is:</p> <ul style="list-style-type: none"> • Logical thinking • Critical thinking • Problem solving <p><small>CLARUSWAY® WAY TO REINVENT YOURSELF</small></p>	<p>5</p>

Use this space to take notes:

Slide 6	Your Response

Slide 6

Your Response

If a problem is too hard, what should you try to do?



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Slide 7

Some Questions to Think About Before Starting

If you find similarities in lots of solutions to different problems what does that probably tell you?

If you have a problem that is just a little different from a problem that you have a solution for, what would you do?

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Use this space to take notes:

Slide 8

► What is Computational Thinking? ➤

Computational thinking is:

- Organising data/information logically (Abstraction)
- Breaking problems into parts (Decomposition)
- Interpreting patterns and models (Pattern Recognition)
- Designing and implementing algorithms (Algorithms)

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Use this space to take notes:

Slide 9

Your Response

What is
programming?

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Students, write your response!

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Slide 10

► What is Computational Thinking? ➤

Computational Thinking is the must step between having a problem and having a solution to that problem.

Computational Thinking aims to teach how to form a solution such that can be programmed into a computer.

**programming
= algorithms
+ coding**

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Slide 11

► Architects or Bricklayers? ➤

Programming is like bricklaying. You don't have to have an in-depth knowledge and thinking to be able to build a wall.

Programming with computational thinking is the architecture.

Architects or Bricklayers



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Slide 12

Four pillars of Computational Thinking ➤

- ▶ Decomposition
- ▶ Pattern Recognition
- ▶ Abstraction
- ▶ Algorithm Design

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Use this space to take notes:

Slide 13



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Decomposition

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Use this space to take notes:

Slide 14

Your Response

Slide 14

Your Response

► Decomposition



Let's discuss and try to predict what does decomposition mean in computational thinking!



JustWriti, write your response!

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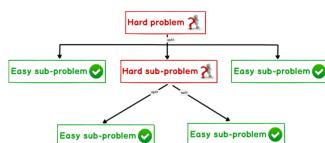
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Slide 15

► Decomposition



It basically means breaking a problem into smaller pieces.



Let's think of some examples of decomposition!

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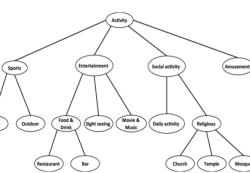
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Slide 16

► Decomposition

We use **tree structures** to visualize decomposition

- ▶ Tree structures help us decompose problems into sub-problems.
- ▶ It consists of blocks connected by branches.
- ▶ Each block that is connected to its parent block which is above it, represents a sub problem of that block.



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Use this space to take notes:

Slide 17

► Decomposition

Try to break these problems into as much sub problems as possible and represent them with tree structures:

- Making a chocolate cake
- Parking a car
- Preparing to go to work in the morning
- Preparing vocation plan
- Become IT guy

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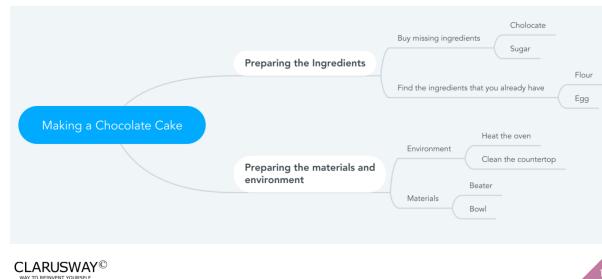


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Slide 18

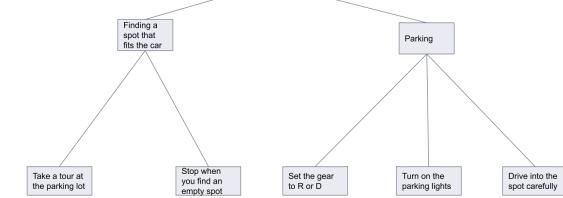
► Making A Chocolate Cake ➤



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Slide 19

► Parking a Car ➤



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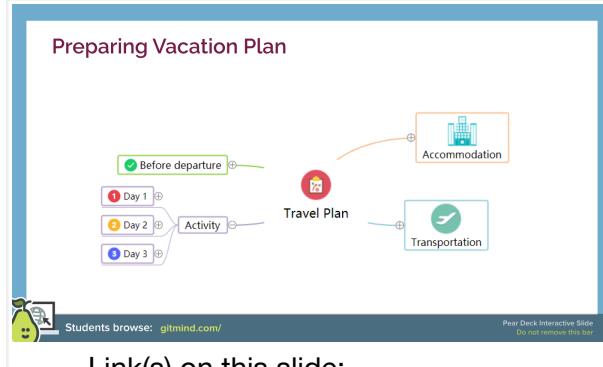
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<https://gitmind.com/>

Slide 20

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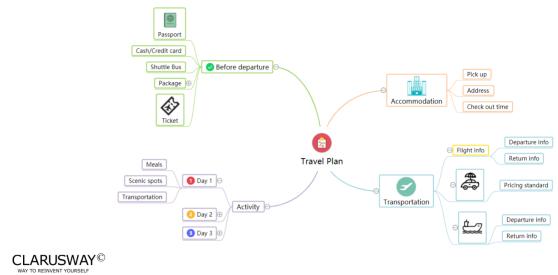
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- <https://gitmind.com/>

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Slide 21

▶ Preparing Vacation Plan



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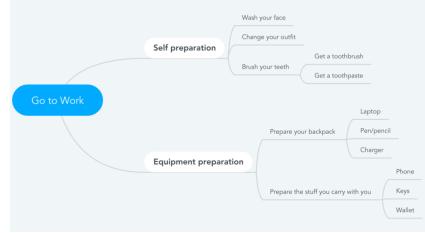
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Slide 22

Your Response

Slide 22	Your Response
<p>Preparing to Go to Work in the Morning</p>  <p> Students, draw anywhere on this slide!</p> <p>Peer Deck Interactive Slide Do not remove this bar</p>	

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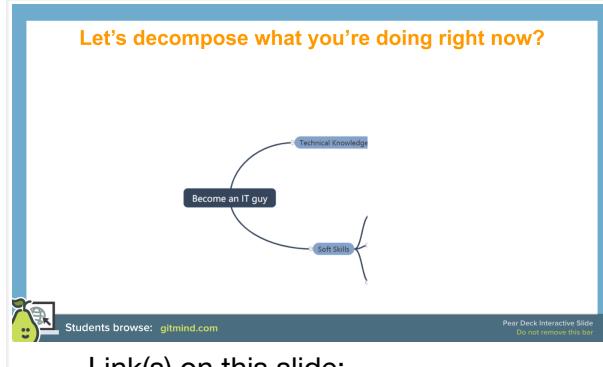
Slide 23	
<p>Preparing to Go to Work in the Morning</p>  <p>23</p>	

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Slide 24

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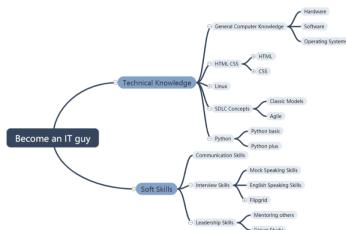
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Slide 25

► Challenge



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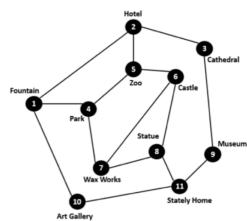
Slide 26

Your Response

Slide 26

Decomposition Challenge

You are a tour guide. Tourists have booked a tour visiting all the city's attractions starting from the hotel they are staying in. This map shows where the attractions are and roads that connect them. You must work out a route that takes your tour group to **every** tourist site. The tourists will not be happy if they pass through the same place twice. They also want to end up back at their hotel that evening.



Students, write your response!

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Your Response

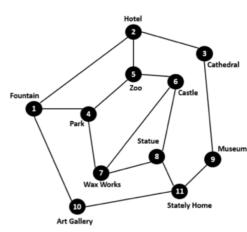
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Slide 27

Decomposition Challenge

You are a tour guide. Tourists have booked a tour visiting all the city's attractions starting from the hotel they are staying in. This map shows where the attractions are and roads that connect them. You must work out a route that takes your tour group to **every** tourist site. The tourists will not be happy if they pass through the same place twice. They also want to end up back at their hotel that evening.

2, 3, 9, 11, 10, 1, 4, 7, 8, 6, 5, 2



Students, write your response!

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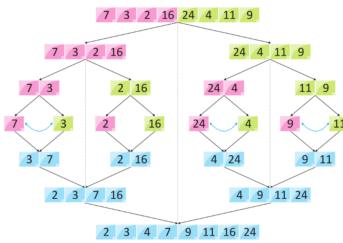
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Your Response

Use this space to take notes:

Slide 28

Decomposition Example



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Use this space to take notes:

Slide 29

► Recap Time



Do you use decomposition in solving your daily problems? If so, what are some examples?

Have you ever used tree structures before? Where did you use them?



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Use this space to take notes:

Slide 30



Pattern Recognition

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Slide 31

► Some Questions to Think About Before Starting



If you find similarities in lots of solutions to different problems what does that probably tell you?

If you have a problem that is just a little different from a problem that you have a solution for, what would you do?

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Use this space to take notes:

Slide 32

Your Response

Slide 32	Your Response
<p>▶ Pattern Recognition</p> <p>Let's discuss and try to predict what does pattern recognition mean in computational thinking!</p>  <p>Peer Deck Interactive Slide Do not refresh this slide</p>	

Use this space to take notes:

Slide 33
<p>▶ Pattern Recognition</p> <p>Pattern recognition is recognising patterns in different things (solutions) and being able to apply these patterns in the solutions of other similar problems.</p>  <p>Pattern recognition is good because we don't have to come up with a new solution each time we encounter the same problem. Instead, we apply the patterns that we have previously recognized.</p> <p>CLARUSWAY® WAY TO REINVENT YOURSELF</p> <p>33</p>

Use this space to take notes:

Slide 34

Challenge

add all the numbers from 1 to 200

- ▶ Big problem?
- ▶ Did you try?
- ▶ A lot to do in your head?

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Use this space to take notes:

Slide 35

Your Response

▶ Pattern Recognition Exercises ➞

Look at the following number patterns and find the sequence.

1 2 5 10 17 ?



Use this space to take notes:

Slide 36

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

1 2 5 10 17 26

Add 1, 3, 5, 7, 9 etc. to previous number

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Slide 37

Your Response

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

123 117 108 99 ?



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Slide 38

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

123 117 108 99 81

Subtract the sum of previous digits ($1 + 2 + 3 = 6$ and $123 - 6 = 117$)

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Slide 39

Your Response

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

12 48 163 26 412 ?????



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Slide 40

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

12 48 163 26 412 8

The spaces are incorrectly added, when they are correct it is a simple x 2 pattern

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Slide 41

Your Response

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

849 352 768 493 527 ?



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Slide 42

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

849 352 768 493 527 684

The numbers are 84935276 repeated and then split into groups of 3 digits

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Slide 43

Your Response

► Pattern Recognition Exercises ➤

Look at the following number patterns and find the sequence.

- 1 *
- 2 ***
- 3 *****
- 4 *****
- 5 *****



Students, write your response!

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Use this space to take notes:

Slide 44

Your Response

Slide 44	Your Response
<p>▶ Finding The Rules of the Game</p> <p>Can you find the rules for this game? If so, how did you find the rules?</p> <p> JustWritin's, write your response!</p> <p><small>Peer Deck Interactive Slide Do not remove this slide.</small></p>	<p>»</p>

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Slide 45	
<p>▶ Finding the Rules of the Game</p> <p>To find the rules we found a pattern that is repeated in both of the user experiences:</p> <p>Phrases like "I guess a number in between 0 and 10", "someone tried to guess it and said..." and "I said ..." are repeated. So we can use these phrases to be able to play the game. Except, we change the parts like the numbers that we guess and statements about the number that is guessed saying whether it is above or below the number that the player thought of.</p> <p><small>CLARUSWAY® WAY TO REINVENT YOURSELF</small></p>	<p>»</p> <p>45</p>

Use this space to take notes:

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► Recap Time



What are some patterns that you recognise in your daily life/problems?

So far, we have learned decomposition and pattern recognition. Can you give an example of combining those to in a solution of a problem?



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Use this space to take notes:

Slide 47



3 ► Abstraction

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Use this space to take notes:

Slide 48

Your Response

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Slide 48

Your Response

► Abstraction

Let's discuss and try to predict what does abstraction mean in computational thinking!



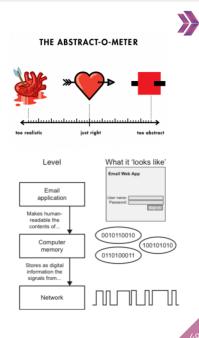
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Slide 49

► Abstraction

Abstraction is getting rid of the useless information that is not going to have any contribution to the solution.

Abstraction is the core concept of computer science and computational thinking. To be able to express a real world problem to a computer, the problem has to be abstract.



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► Abstraction



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Use this space to take notes:

Slide 51

Your Response

► Let's abstract stuff!



The key part of abstraction is ignoring the useless aspects of something and including the beneficial aspects. So, find out the useless aspects that are going to be ignored and the beneficial aspects that are going to be considered of the items below. Try going abstract as far as possible.(For example a house is nothing but a shelter for humans when you look abstractly)

Car



Pencil



House



Mobile phone



HINT: Think of what do these objects help solving and which aspects of them wouldn't prevent them from solving that particular problem.



Students, write your response!

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Slide 52

► Let's Abstract Stuff!



The abstractions should look something like this:

Object	Include	Ignore
Car	Engine, tires, rims, seat	Color, shape, trunk, radio
Pencil	color of the tip, grip	material, brand, type
Mobile phone	speaker, microphone, cellular	color, brand, camera

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Use this space to take notes:

Slide 53

► Let's Abstract Stuff!



Finally, try to describe the objects that you have abstracted, ignoring the parts that you think should be ignored, and including the parts that you think should be included.

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Slide 54

► Recap Time



What are some examples of abstraction that we encounter in our daily lives?



Do you think that you already abstract stuff?
Can you give any examples?



Why do you think abstraction is important for computer science?

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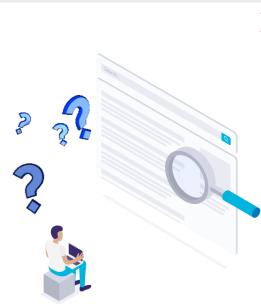
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Slide 55



Use this space to take notes:

THANKS!
Any questions?



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