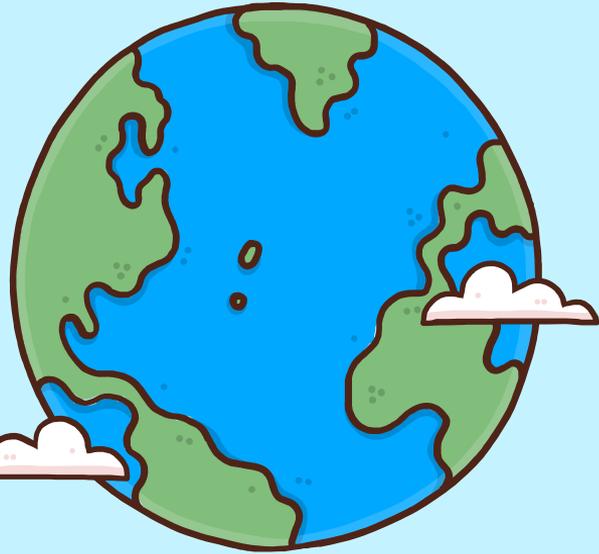


# Putting It All Together

K-3 Science Summer Symposium  
July 10-13



Alberta **Regional** Consortia



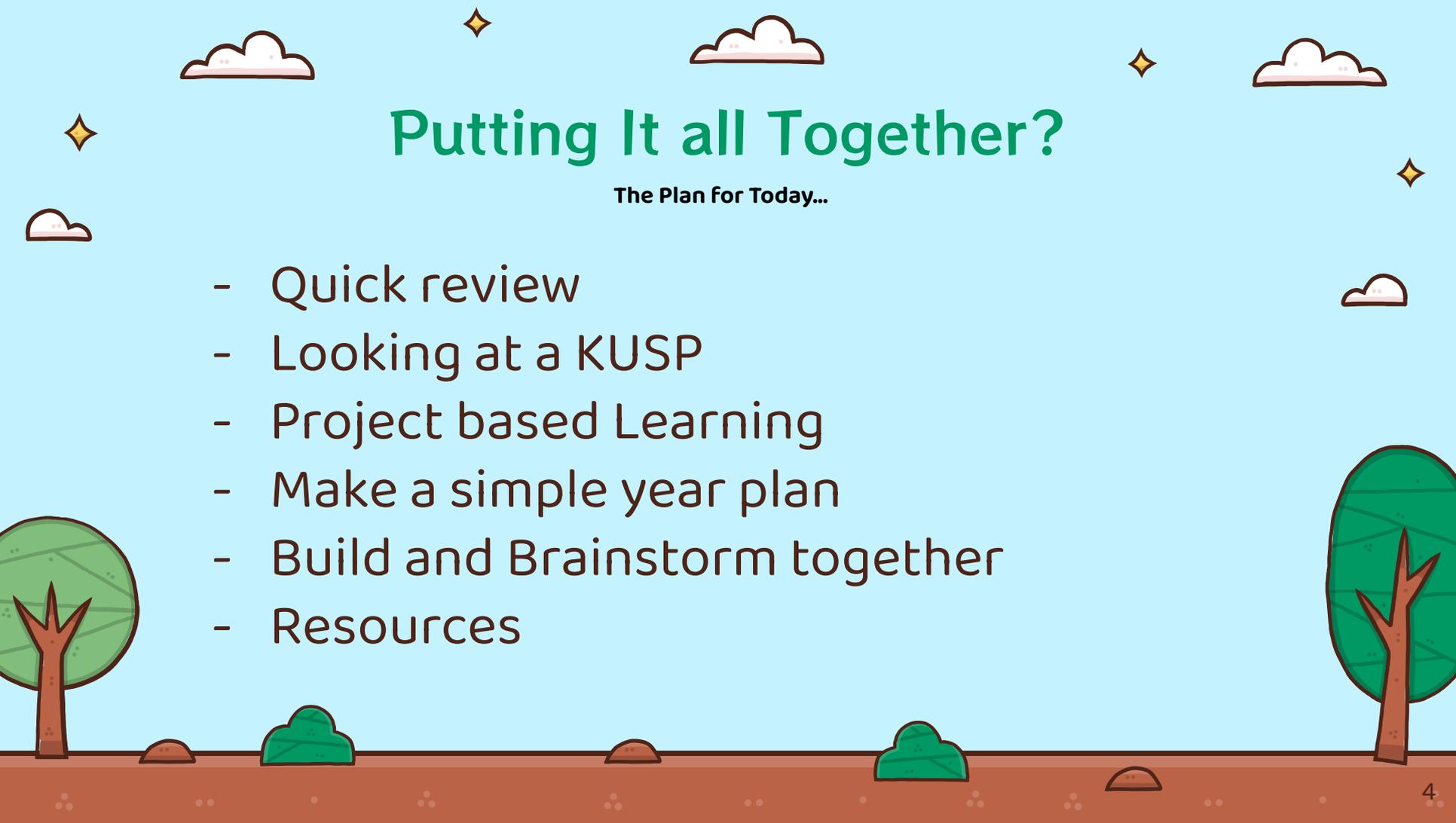
# Jess Oracheski

- Current classroom teacher
- Mom and Wife
- LNES Consultant
- [jess.oracheski@arpdc.ab.ca](mailto:jess.oracheski@arpdc.ab.ca)

# Land Acknowledgment



In the spirit of reconciliation, we want to acknowledge that this gathering is taking place on traditional lands across the province of Alberta, home to many diverse First Nations, Métis and Inuit peoples. We acknowledge that this land is a traditional meeting ground giving voice to its original peoples and the story of creation of this country in a way that history has forgotten.

The background is a light blue sky with several white, fluffy clouds and yellow four-pointed stars. At the bottom, there is a brown ground line with green bushes and trees. The title 'Putting It all Together?' is written in a large, green, sans-serif font.

# Putting It all Together?

The Plan for Today...

- Quick review
- Looking at a KUSP
- Project based Learning
- Make a simple year plan
- Build and Brainstorm together
- Resources

# PHASES of LEARNING

## Surface

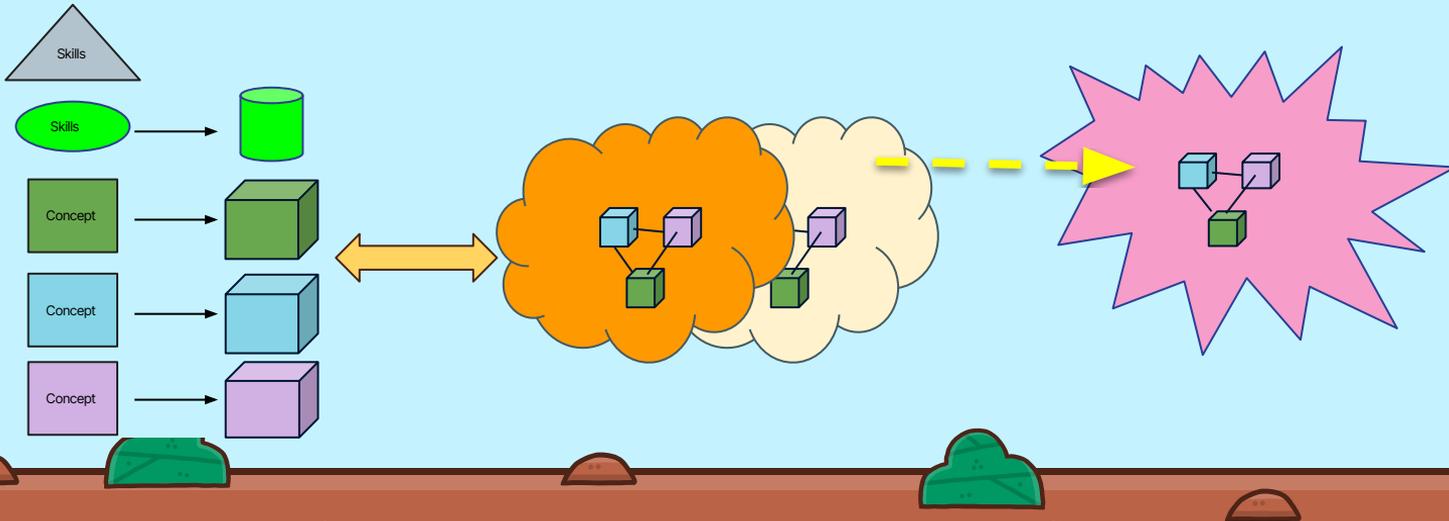
- Develop concepts (knowledge)
- Develop skills or procedures that will be used in the Transfer/Assessment Phase

## Deep

- Begin developing connections between concepts.
- Develop the **understandings**.

## Transfer

- Apply understandings and skills to a variety of novel and unrelated contexts.
- Summative assessments



# PHASES of LEARNING

## Volleyball Analogy

### Surface

- What is a bump, set & serve?
- How do I bump set and serve?

### Deep

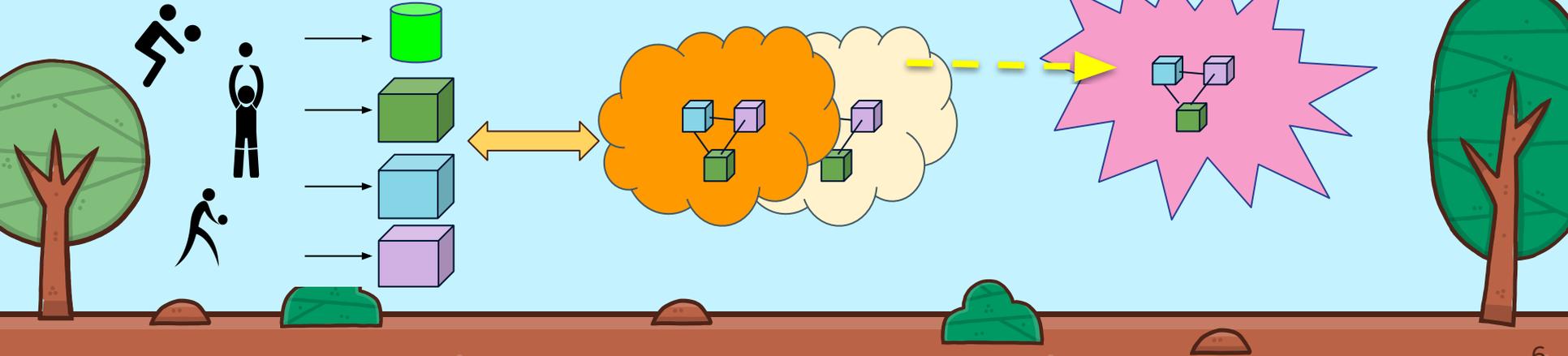
Put bump, set and serve together in a game.

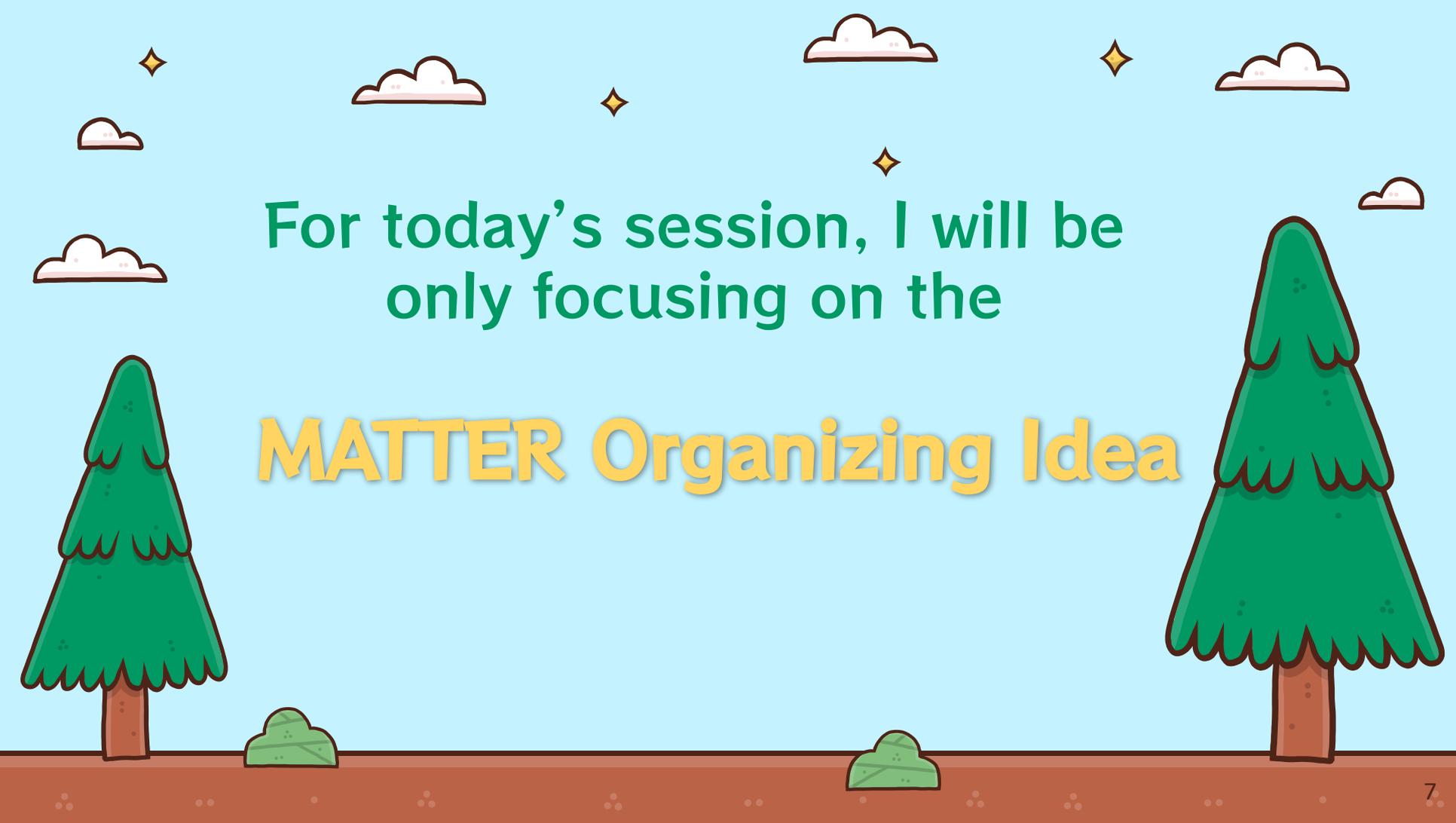
- **Guided Scrimmages**
- **Practice Games**

### Transfer

- **Playing New Teams**

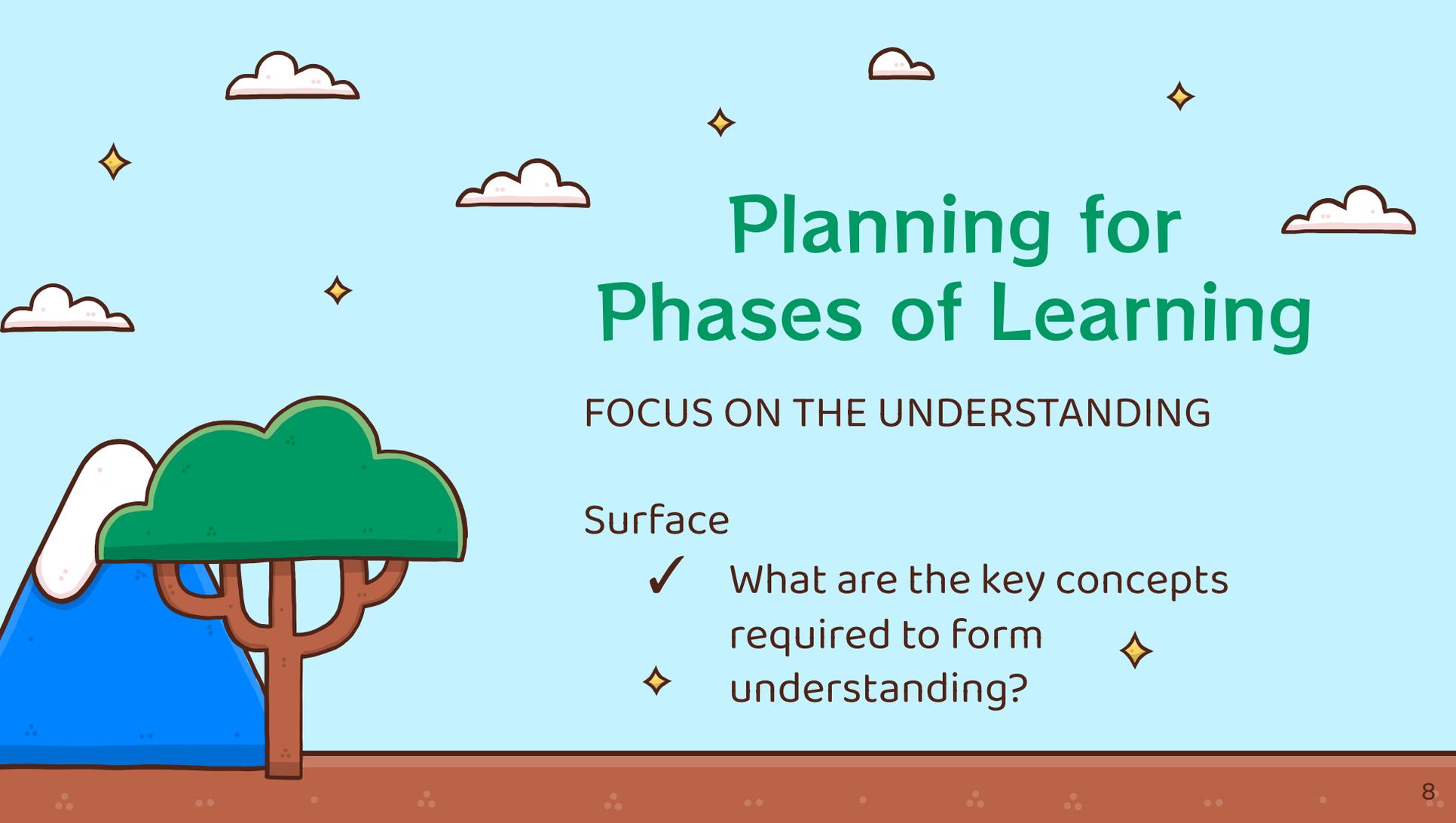
#### Practice





For today's session, I will be  
only focusing on the

**MATTER** Organizing Idea



# Planning for Phases of Learning

FOCUS ON THE UNDERSTANDING

Surface

- ✓ What are the key concepts required to form understanding?
- ◆

Organizing Idea

Matter: Understandings of the physical world are deepened by investigating matter and energy.

Guiding Question

How can properties of an object be distinguished from one another?

Learning Outcome

Children examine properties of objects.

Knowledge

Understanding

Skills & Procedures

**KM1.1**  
**KINDERGARTEN**  
**Matter**

An object is anything that can be perceived using one or more of the five senses.

The five senses are s

- sight
- touch
- hearing
- smell
- taste

Properties are distinctive characteristics.

Properties of objects that can be perceived using one or more of the five senses include

- colour; e.g., blue, yellow
- size; e.g., long, short
- shape; e.g., round, square
- texture; e.g., rough, smooth
- temperature; e.g., hot, cold
- sound; e.g., loud, quiet
- scent; e.g., fresh, rotten
- taste; e.g., sweet, sour

Objects have identifiable properties.

Objects may be similar in one or more properties and different in another property.

**Focus on the Understanding.**

Explore properties of various objects using one or more of the five senses.

Describe properties of various objects.

Sort various objects according to properties.

Compare properties of various objects.



Organizing Idea

Matter: Understandings of the physical world are deepened by investigating matter and energy.

Guiding Question

How can properties of an object be distinguished from one another?

Learning Outcome

Children examine properties of objects.

Knowledge

Understanding

Skills & Procedures

**KM1.1**  
**KINDERGARTEN**  
**Matter**

An **object** is anything that can be perceived using one or more of the five senses.

The **five senses** are s

- sight
- touch
- hearing
- smell
- taste

**Properties** are distinctive characteristics.

Properties of objects that can be perceived using one or more of the five senses include

- **colour**; e.g., blue, yellow
- **size**; e.g., long, short
- **shape**; e.g., round, square
- **texture**; e.g., rough, smooth
- **temperature**; e.g., hot, cold
- **sound**; e.g., loud, quiet
- **scent**; e.g., fresh, rotten
- **taste**; e.g., sweet, sour

**Objects** have **identifiable properties**.

Objects may be **similar** in one or more properties and **different** in another property.

Explore properties of various objects using one or more of the five senses.

Describe properties of various objects.

Sort various objects according to properties.

Compare properties of various objects.

**What are the key concepts required to form the understanding?**

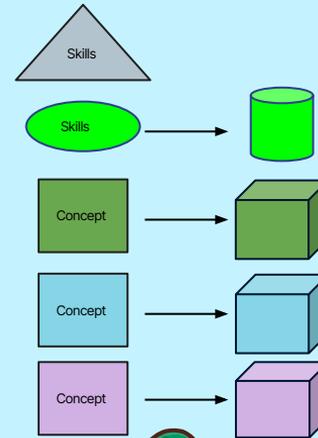


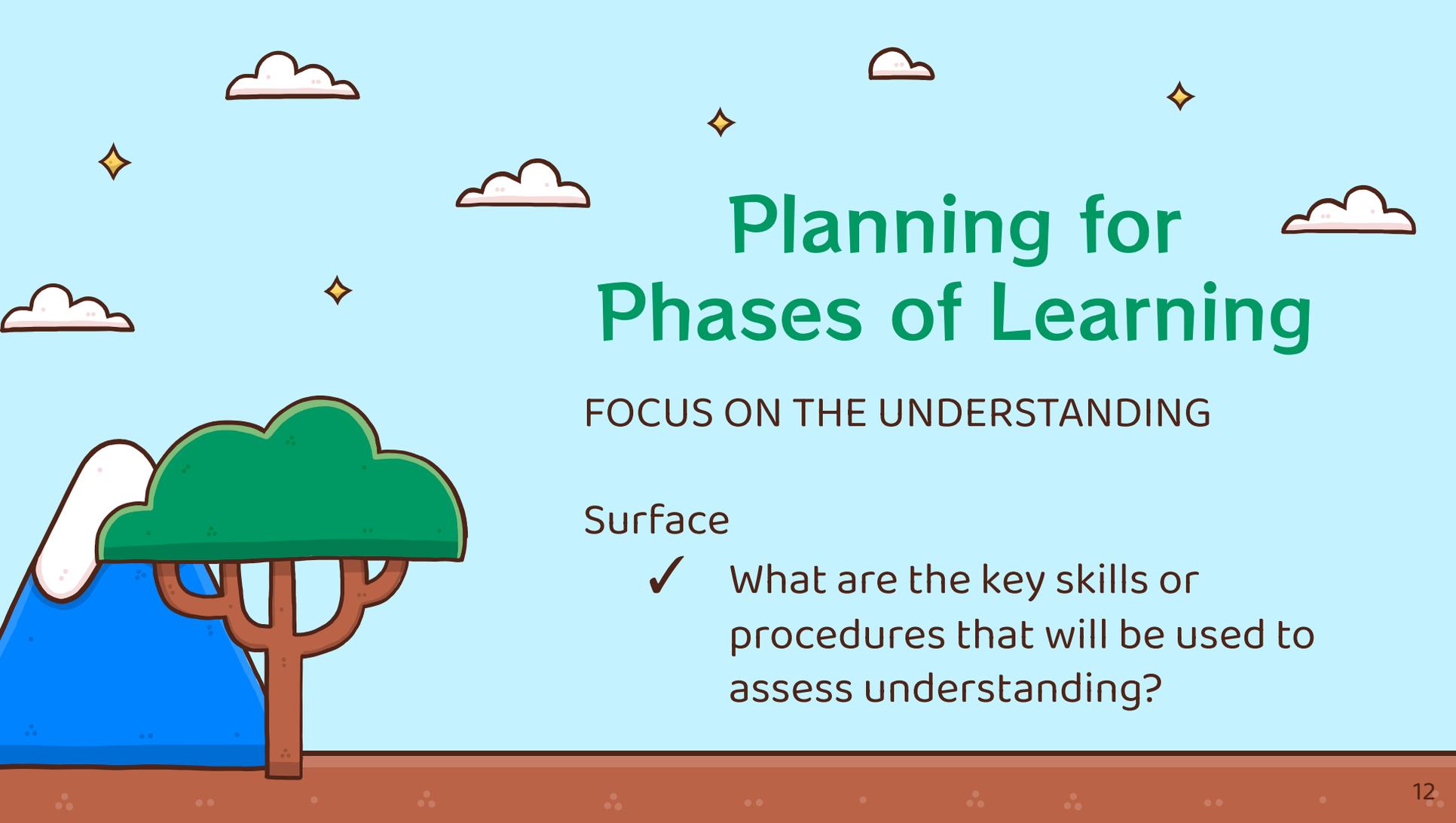
# PHASES of LEARNING

## Surface

- object
- senses
  - sight
  - touch
  - hearing
  - smell
  - taste
- property
- Identifiable property
  - colour
  - size
  - shape
  - texture
  - temperature
  - sound
  - scent
  - Taste
- similarity & difference

- Develop concepts (knowledge)
- Develop skills or procedures that will be used in the Transfer/Assessment Phase





# Planning for Phases of Learning

FOCUS ON THE UNDERSTANDING

Surface

- ✓ What are the key skills or procedures that will be used to assess understanding?

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be altered?		
Learning Outcome	Students analyze properties of objects and investigate how they can be changed.		

	Knowledge	Understanding	Skills & Procedures
<b>1M1.1</b> Grade 1 Matter	<p><b>Measurable properties of objects include</b></p> <ul style="list-style-type: none"> <li>length</li> <li>how much flat space an object covers (area)</li> <li>weight (mass)</li> </ul> <p>Weight is the heaviness of an object.</p> <p>Tools, such as balance scales and magnifying glasses, can be used to examine properties of objects and materials.</p>	<p><b>Objects have measurable properties.</b></p>	<p><b>Identify</b> measurable properties of objects.</p> <p><b>Directly compare</b> the length, area, and weight of various objects.</p> <p><b>Use various tools safely</b> when <b>examining</b> the properties of objects.</p>

**Match the Skills and Procedures statement to to the Knowledge and Understanding statements.**

**What are the key skills or procedures that will be used to assess understanding?**

**What are the key concepts required to form the understanding?**

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can the suitability of materials be determined for specific purposes?		
Learning Outcome	Students investigate properties of materials and relate them to a <b>purpose</b> .		

	Knowledge	Understanding	Skills & Procedures
<b>2M1.1</b> Grade 2 Matter	<b>Materials</b> are used to make <b>objects</b>	<b>Materials</b> can be combined in a variety of ways to make <b>objects</b> <i>(for a specific purpose)</i>	Identify <b>analyze</b> the materials used to make various objects.  Combine materials to <b>create</b> an object for a specific <b>purpose</b> .

What are the key concepts required to form the understanding?

What are the key skills or procedures that will be used to assess understanding?

Organizing Idea

Matter: Understandings of the physical world are deepened by investigating matter and energy.

Guiding Question

How can materials change?

Learning Outcome

Students investigate and analyze how materials have the potential to be changed.

Knowledge

Understanding

Skills & Procedures

**3M1.2**  
Grade 3  
Matter

**Matter** is anything that takes up space and has weight.

**States of matter** include **solid, liquid, and gas.**

**Melting** is a change of state from solid to liquid.

**Freezing** is a change of state from liquid to solid.

**Evaporation** is a change of state from liquid to gas.

**Condensation** is a change of state from gas to liquid.

**Matter** can change state if **heated (heating)** or **cooled (cooling).**

**Conduct an investigation** to demonstrate changes of state.

**Discuss** examples of daily activities that include heating and cooling.

What are the key concepts required to form the understanding?

What are the key skills or procedures that will be used to assess understanding?

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.
Guiding Question	How can properties of an object be distinguished from one another?
Learning Outcome	Children examine properties of objects.

	Knowledge	Understanding	Skills & Procedures
<b>KM1.1</b> <b>KINDERGARTEN</b> <b>Matter</b>	<p>An <b>object</b> is anything that can be perceived using one or more of the five senses.</p> <p>The <b>five senses</b> are s</p> <ul style="list-style-type: none"> <li>• sight</li> <li>• touch</li> <li>• hearing</li> <li>• smell</li> <li>• taste</li> </ul> <p><b>Properties</b> are distinctive characteristics.</p> <p>Properties of objects that can be perceived using one or more of the five senses include</p> <ul style="list-style-type: none"> <li>• <b>colour</b>; e.g., blue, yellow</li> <li>• <b>size</b>; e.g., long, short</li> <li>• <b>shape</b>; e.g., round, square</li> <li>• <b>texture</b>; e.g., rough, smooth</li> <li>• <b>temperature</b>; e.g., hot, cold</li> <li>• <b>sound</b>; e.g., loud, quiet</li> <li>• <b>scent</b>; e.g., fresh, rotten</li> <li>• <b>taste</b>; e.g., sweet, sour</li> </ul>	<p><b>Objects</b> have <b>identifiable properties</b>.</p> <p>Objects may be <b>similar</b> in one or more properties and <b>different</b> in another property.</p>	<p><b>Explore</b> properties of various objects using one or more of the five senses.</p> <p><b>Describe</b> properties of various objects.</p> <p><b>Sort</b> various objects according to properties.</p> <p><b>Compare</b> properties of various objects.</p>

What are the key concepts required to form the understanding?

What are the key skills or procedures that will be used to assess understanding?

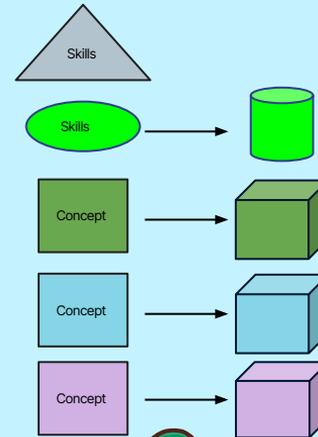
# PHASES of LEARNING

## Surface

- object
- senses
  - sight
  - touch
  - hearing
  - smell
  - taste
- property
- Identifiable property
  - colour
  - size
  - shape
  - texture
  - temperature
  - sound
  - scent
  - Taste
- similarity & difference

- explore (observe)
- describe
- sort
- compare & contrast

- Develop concepts (knowledge)
- Develop skills or procedures that will be used in the Transfer/Assessment Phase





# Surface Level Planning (Concept Attainment)



Kindergarten

Grade One



Grade Two

Grade Three



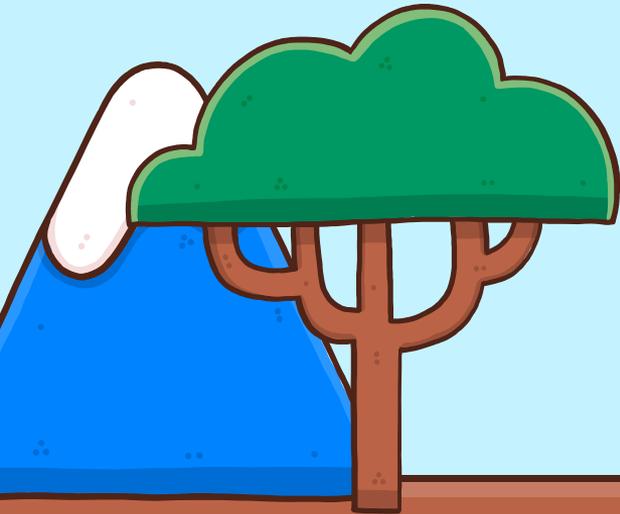
You Can Make a Copy after Previewing



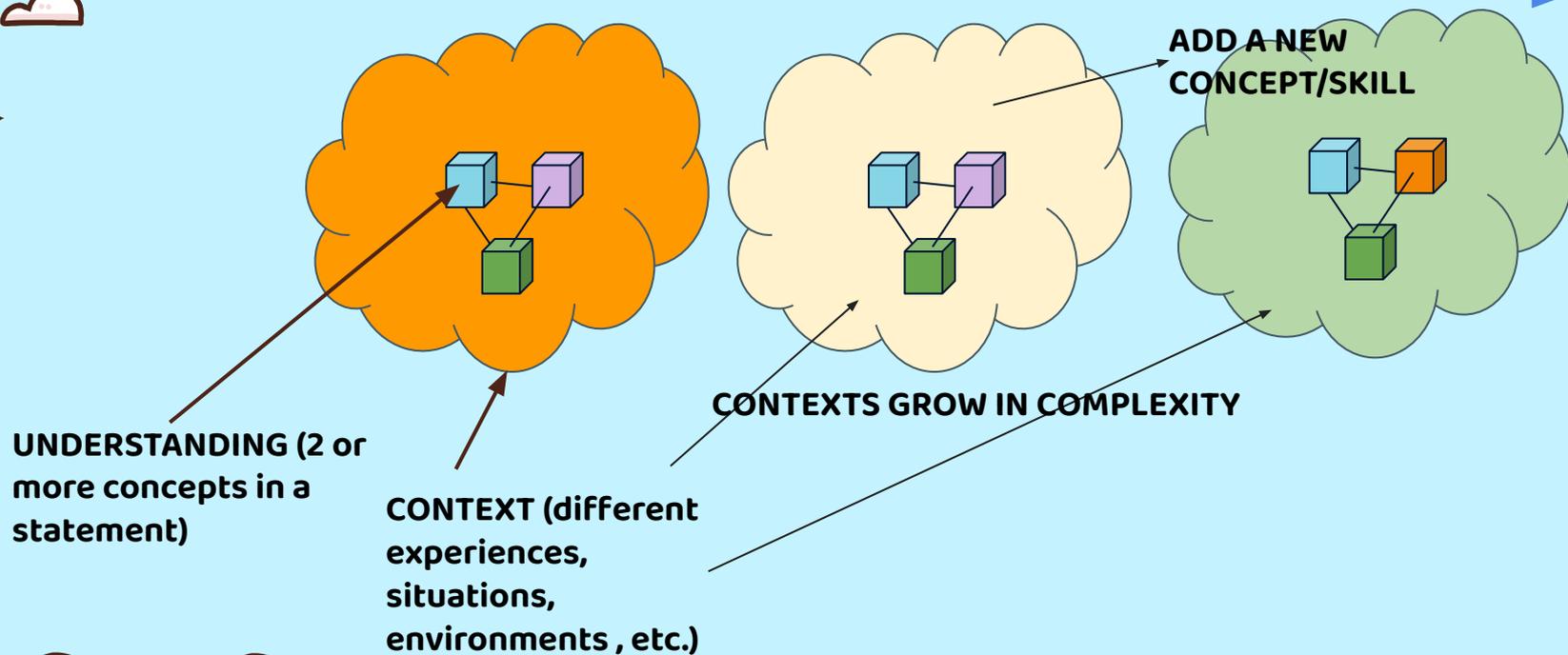
# Planning for Phases of Learning

Deep

- ✓ Connecting two or more concepts in relationship to each other
- ✓ Vary context



# Understanding Deepens by Applying It in different Contexts



Organizing Idea

Matter: Understandings of the physical world are deepened by investigating matter and energy.

Guiding Question

How can properties of an object be distinguished from one another?

Learning Outcome

Children examine properties of objects.

**KM1.1**  
KINDERGARTEN  
Matter

Knowledge

Understanding

Skills & Procedures

Objects have identifiable properties.

Objects may be similar in one or more properties and different in another property.

Explore properties of various objects using one or more of the five senses. ... and

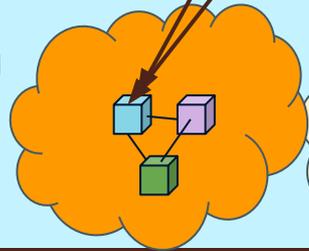
Describe properties of various objects.

Sort various objects according to properties.

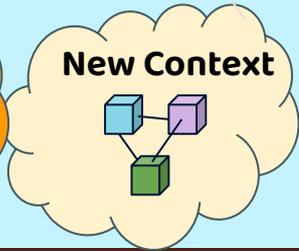
Compare properties of various objects.

Understanding

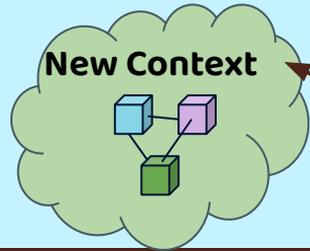
Context 1



New Context



New Context



Different environments and/or different objects.

Organizing Idea

Matter: Understandings of the physical world are deepened by investigating matter and energy.

Guiding Question

How can properties of an object be altered?

Learning Outcome

Students analyze properties of objects and investigate how they can be changed.

**1M1.1**  
Grade 1  
Matter

Knowledge

Understanding

Skills & Procedures

Objects have measurable properties.

Identify measurable properties of objects.

Directly compare the length, area, and weight of various objects.

Use various tools safely when examining the properties of objects

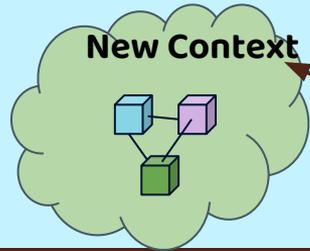
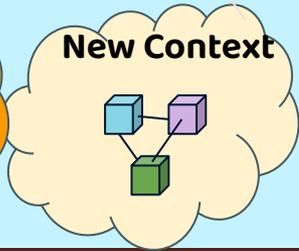
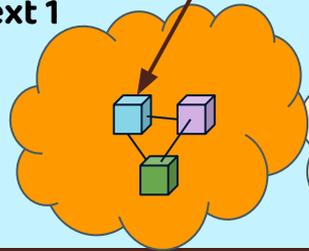
Understanding

Context 1

New Context

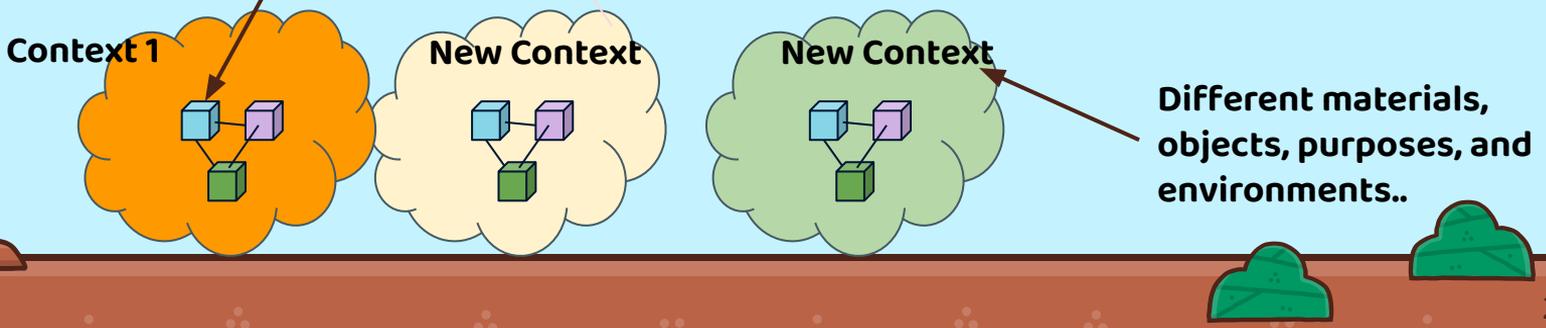
New Context

Different environments and/or different objects.



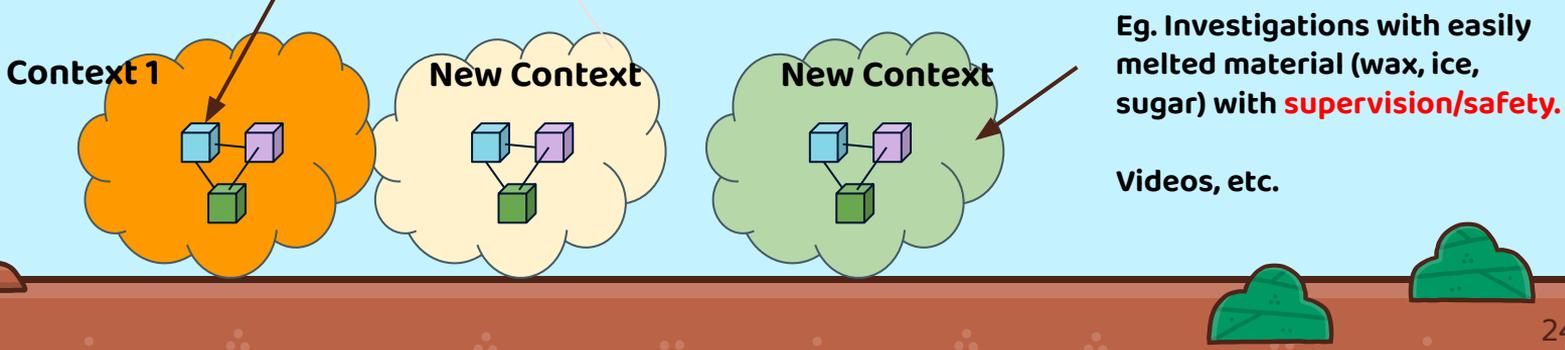
<b>Organizing Idea</b>	<b>Matter: Understandings of the physical world are deepened by investigating matter and energy.</b>		
<b>Guiding Question</b>	<b>How can properties of an object be altered?</b>		
<b>Learning Outcome</b>	<b>Students investigate properties of materials and relate them to a purpose.</b>		

	Knowledge	Understanding	Skills & Procedures
<b>2M1.1</b> Grade 2 Matter		<b>Materials can be combined in a variety of ways to make <u>objects</u> (for a specific purpose)</b>	<b>Identify the materials used to make various objects.</b>  <b>Combine materials to create an object for a specific purpose.</b>



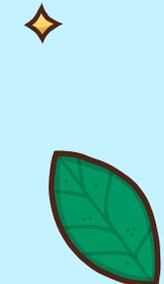
<b>Organizing Idea</b>	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
<b>Guiding Question</b>	How can materials change?		
<b>Learning Outcome</b>	SStudents investigate and analyze how materials have the potential to be changed.		

	Knowledge	Understanding	Skills & Procedures
<b>3M1.2</b> Grade 3 Matter		<b>Matter can change state if heated (heating) or cooled (cooling).</b>	<b>Conduct an investigation to demonstrate changes of state.</b>  Discuss examples of daily activities that include heating and cooling.





# Deep Level Planning (Connecting Concepts)



Kindergarten

Grade One



Grade Two

Grade Three



**MAKE A COPY After Preview**

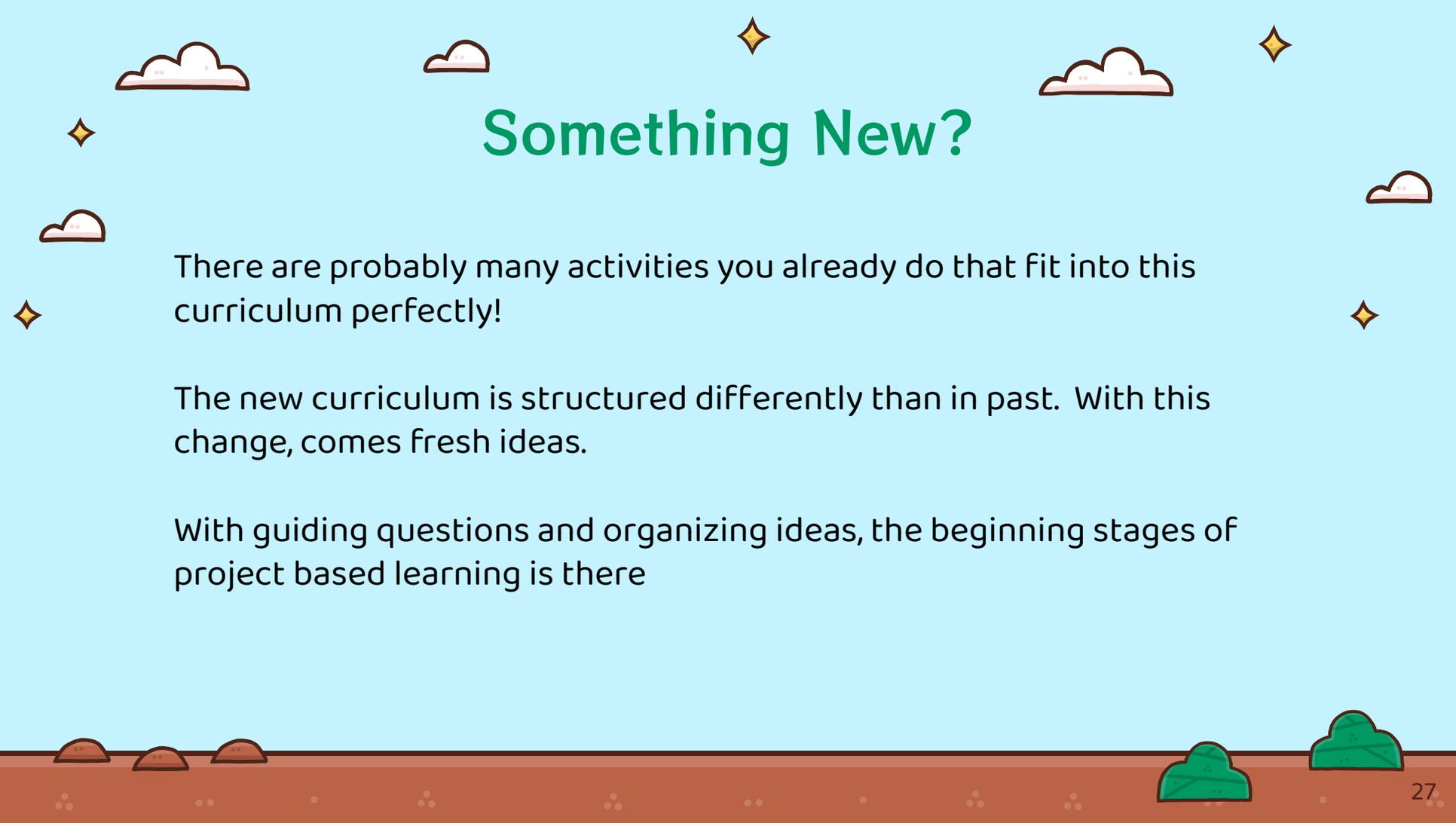




# Planning for Phases of Learning

Transfer

- ✓ Application of surface and deep learning to a new or novel situation

The background is a light blue sky with several white, fluffy clouds of various sizes. There are also several yellow, four-pointed stars scattered across the sky. At the bottom, there is a brown ground line with some green bushes and small white dots representing soil or grass.

# Something New?

There are probably many activities you already do that fit into this curriculum perfectly!

The new curriculum is structured differently than in past. With this change, comes fresh ideas.

With guiding questions and organizing ideas, the beginning stages of project based learning is there



# Project Based Learning

WHERE STUDENTS COLLABORATE TO SOLVE A PROBLEM IN THE REAL WORLD.  
WHERE STUDENTS LEARN CONCEPTS AND APPLY THEM IN THEIR PROJECT.



**Begin with the end in mind... What do they need to know and be able to do?**

- Look at the curriculum - any ideas?



**Get the students interested**

- What are your students interested in?
- Any problems in the school?

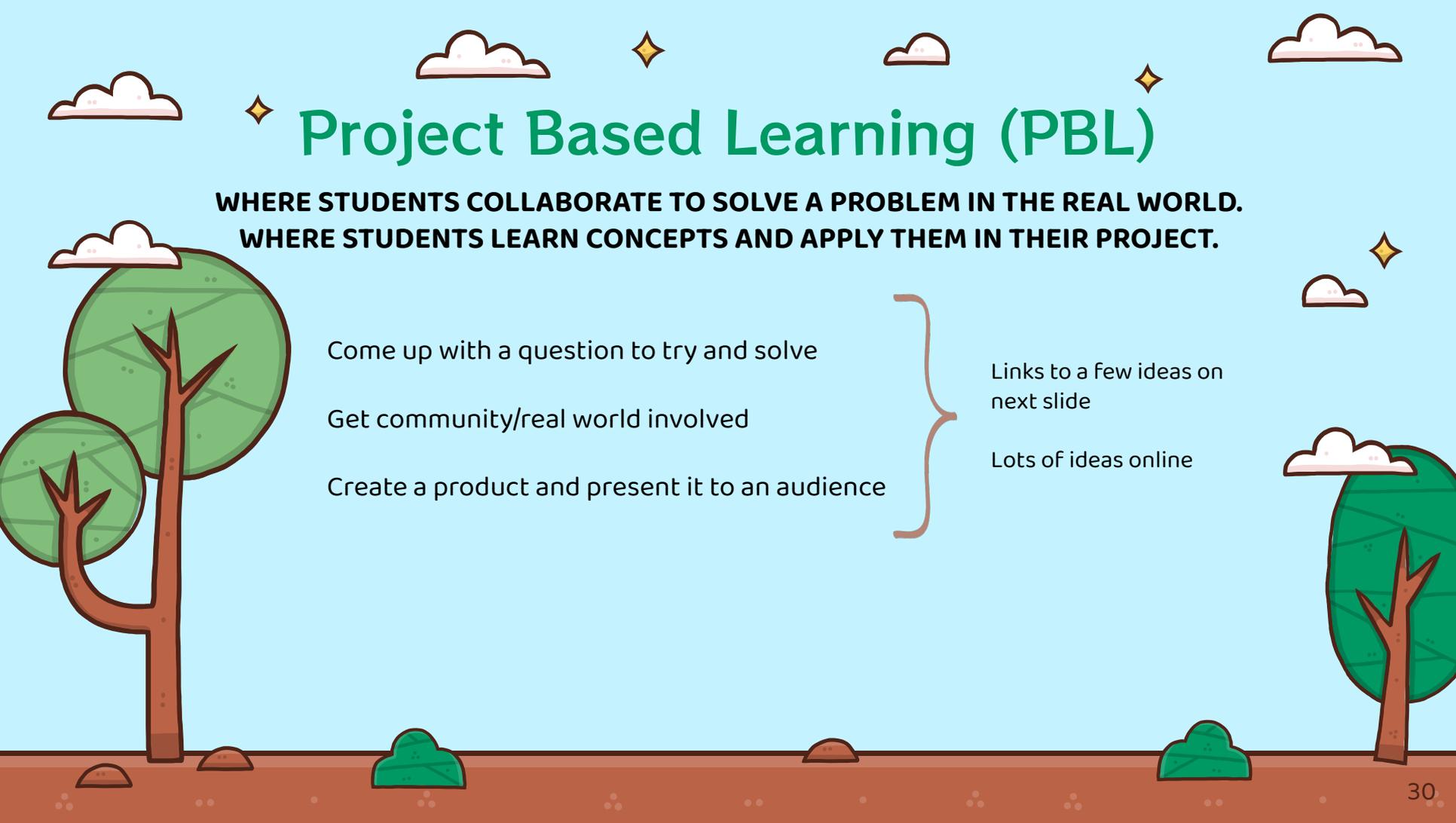


## Thought Books

Have students pause and record their thinking throughout the unit of study to connect what they have learned (via SURFACE and DEEP phases) to the project/question. This allows you to see their growth and thinking over time.



**Trevor Muir - Project Based Learning in the Elementary Classroom**



# Project Based Learning (PBL)

**WHERE STUDENTS COLLABORATE TO SOLVE A PROBLEM IN THE REAL WORLD.**

**WHERE STUDENTS LEARN CONCEPTS AND APPLY THEM IN THEIR PROJECT.**

Come up with a question to try and solve

Get community/real world involved

Create a product and present it to an audience

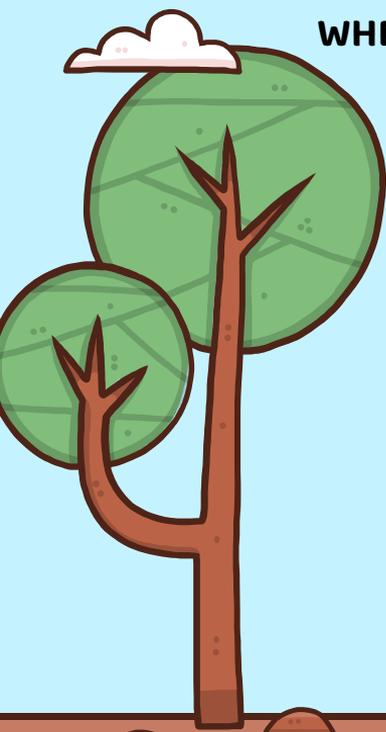
Links to a few ideas on  
next slide

Lots of ideas online



# PBL – A FEW NOTES

**WHERE STUDENTS COLLABORATE TO SOLVE A PROBLEM IN THE REAL WORLD.  
WHERE STUDENTS LEARN CONCEPTS AND APPLY THEM IN THEIR PROJECT.**

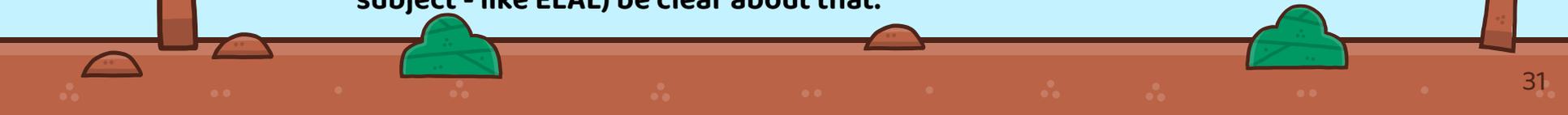


**Introduce the project at the beginning.** It is the hook we are using to capture the students' attention.

Products are varied and don't just mean a diorama. Presenting to an audience doesn't have to mean speak publicly (but it could).

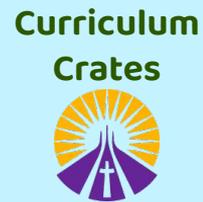
Projects are done **AT SCHOOL**. You cannot assess work done at home as you don't know who did the work.

What matters the most is the demonstration and application of knowledge; not how much glitter was used on the poster. **Make sure you are assessing SCIENCE KUSPs and if you are assessing other KUSPs (from another subject - like ELAL) be clear about that.**





Ideas



**Project Based Learning**

**PBL Works**

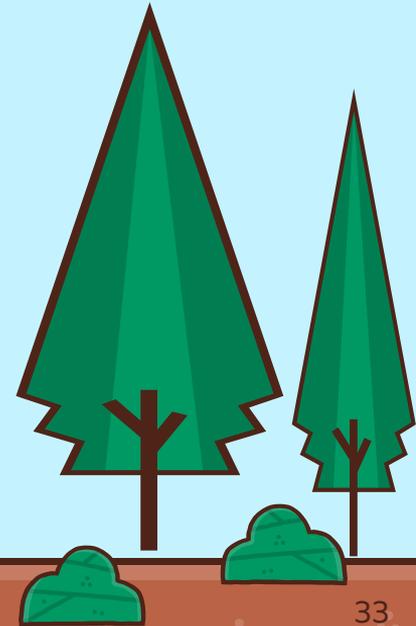
**Scope and Sequence**

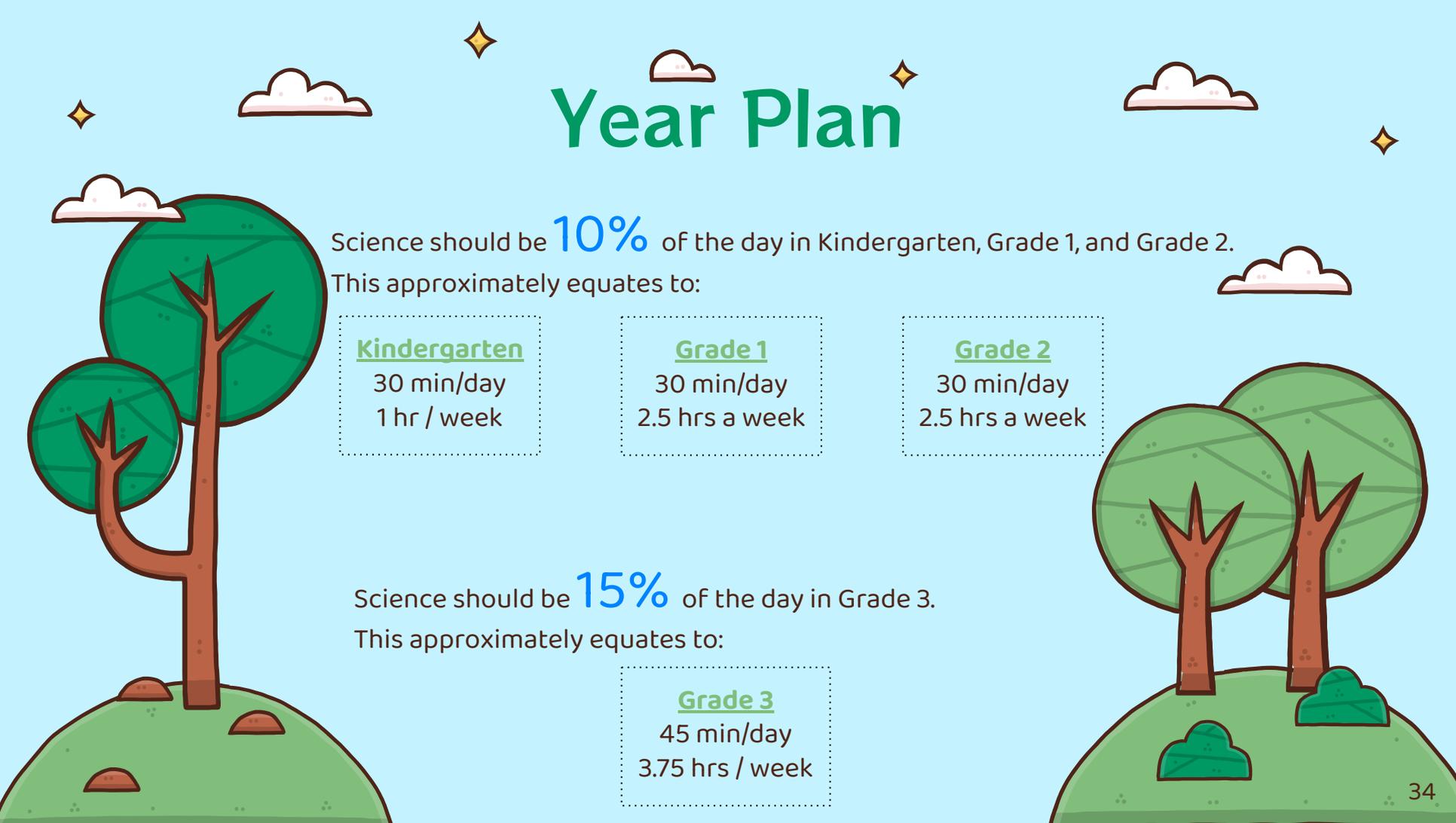


**55 Ideas for Project Based Learning**

# BIG PICTURE

Organizing Idea	K	1	2	3	4	5	6
Matter							
Energy							
Earth Systems							
Living Systems							
Space							
Computer Science							
Scientific Method							





# Year Plan

Science should be **10%** of the day in Kindergarten, Grade 1, and Grade 2.

This approximately equates to:

## Kindergarten

30 min/day  
1 hr / week

## Grade 1

30 min/day  
2.5 hrs a week

## Grade 2

30 min/day  
2.5 hrs a week

Science should be **15%** of the day in Grade 3.

This approximately equates to:

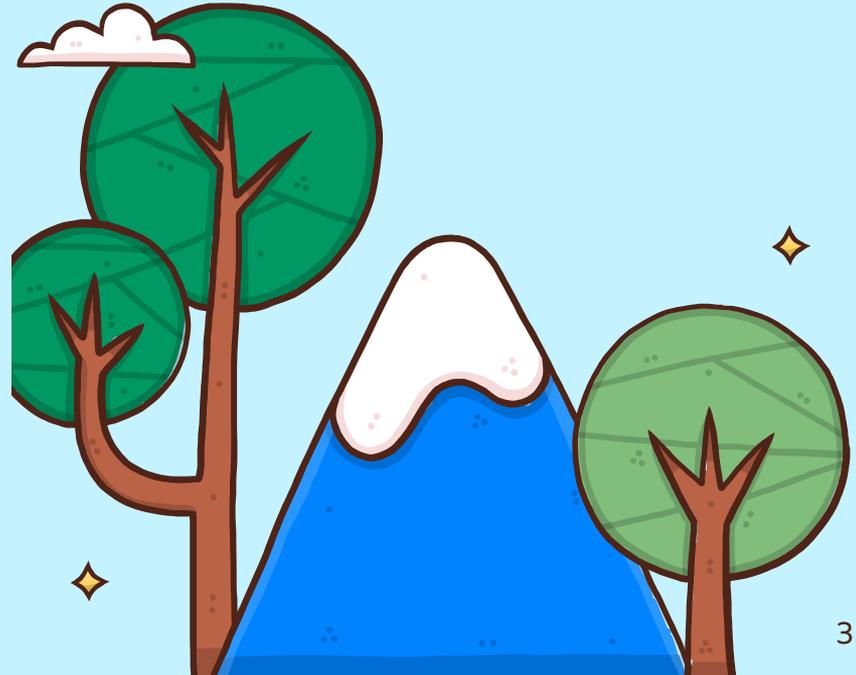
## Grade 3

45 min/day  
3.75 hrs / week

# If it was me...

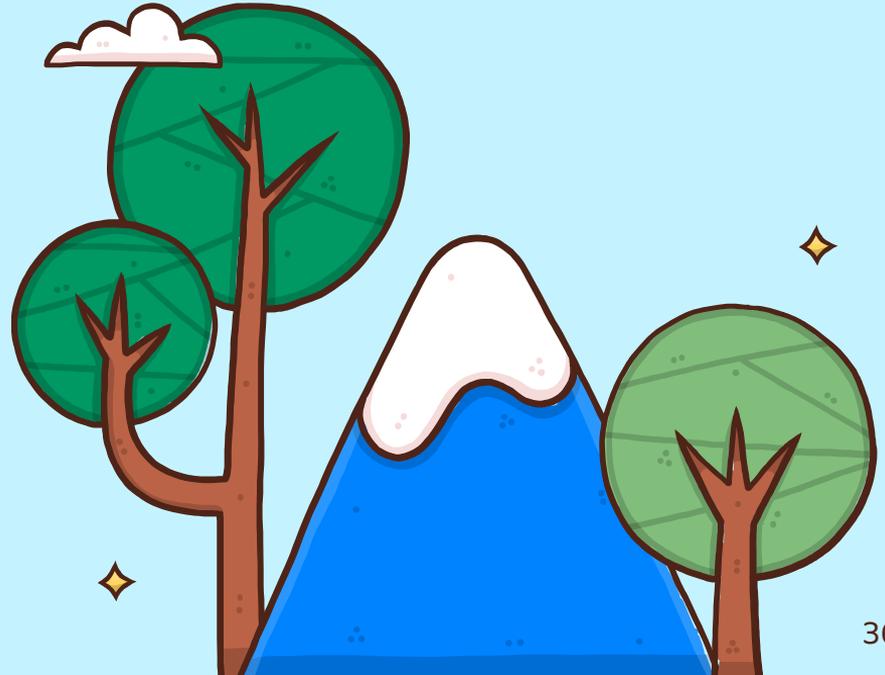
## A Year Plan

- **September** = leave for classroom routine
  - focus on reading, math
  - introduce and reiterate Scientific Methods and Computer Science concepts through STEM challenges
- **Salt and Pepper**
  - Integrate 'Scientific Methods OI' and 'Computer Science OI' in with the other organizing ideas
- **June**
  - Leave for activities, some wiggle room in planning, track, etc



# YOU DO YOU!

- Ultimately, that was only one way to do a year plan. Feel free to do it how your brain works. There is flexibility - **MANY DIFFERENT WAYS** to plan your year.
- Another Idea: **SCIENCE CAMPS**
  - Flip flop science and social for an entire month or so
    - Days have lots of science and no social and then they switch



The slide features a light blue background with several decorative elements: white clouds with pink outlines and small pink dots, and yellow four-pointed stars. A large green plant with two leaves and a brown pot is positioned on the right side of the slide.

# MAKING YOUR OWN YEAR PLAN

1. Click on the link for your grade on the next slide.
2. It will prompt you to make your own copy. Click the blue 'make a copy button'
3. **Page 1:** Click on curriculum link. Read through and make notes in the chart of what comes to mind
4. **Page 2:** Make a basic Year plan. Things to keep in mind:
  - a. Weather
  - b. activities in community
  - c. activities in school
  - d. holidays, etc



# Year Planning Template



Kindergarten

Grade One



Grade Two

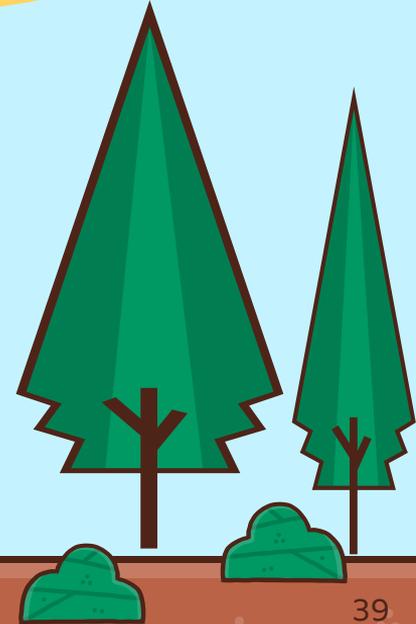
Grade Three



Force copy set up.

# BIG PICTURE

Organizing Idea	K	1	2	3	4	5	6
Matter							
Energy							
Earth Systems							
Living Systems							
Space							
Computer Science							
Scientific Method							



# Kindergarten

## Matter Transfer Ideas

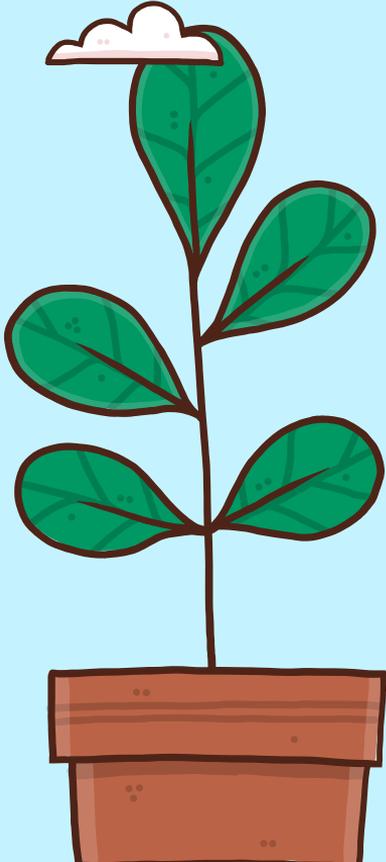
*\*\*After students have demonstrated a knowledge of the 5 senses*

## Various Field Trips around Town

- Grocery Store
- Skating Rink
- Curling Rink
- Fire Hall
- Post Office
- Bank



- As a class, describe objects in each location using their 5 senses. Note the properties of each object.
  - Record these observations. Take pictures/video of objects
  - Once back in class, describe objects at each place.
    - 'Mayor has asked the Kindergarten class to create a 'GUESS WHAT' game that could be played throughout the community
      - Describe objects using 5 senses, next 'page' would be image



# Grade 1

Matter Transfer Ideas

## Packaging Problems

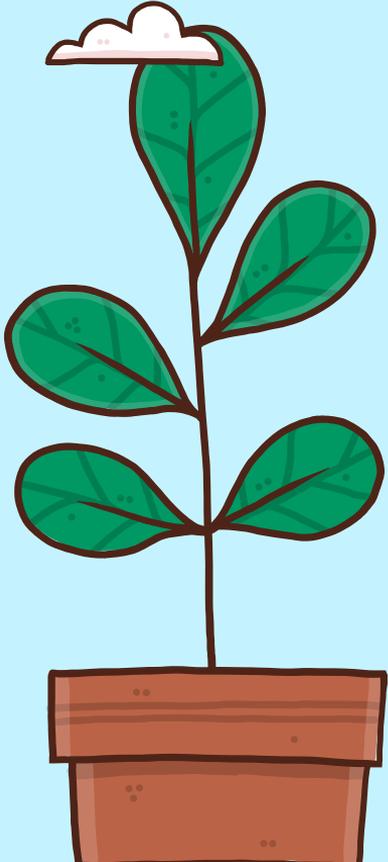
- Students need to 'mail' a variety of items (paper, pipe cleaners, playdough, rocks, styrofoam, popsicle sticks, etc), but they need to fit inside a certain box.
- Students will describe the properties of the items
- Students need to then figure out how to get the items in the box
  - (through trial and error, students will eventually figure out how to **PHYSICALLY CHANGE** the objects so that it fits inside the box)

# Grade 2

## Matter Transfer Ideas

### 3 Little Pigs STEAM Design Challenge

- Introduce it the first day of the Organizing idea, and then introduce concepts and build as you go.
- Test various materials and see which properties are most desired
- Discuss , identify, and sort which materials would be 'natural' or 'processed'



# Grade 3

## Matter Transfer Ideas

- Have students write a circle story emphasizing the concepts listed below.

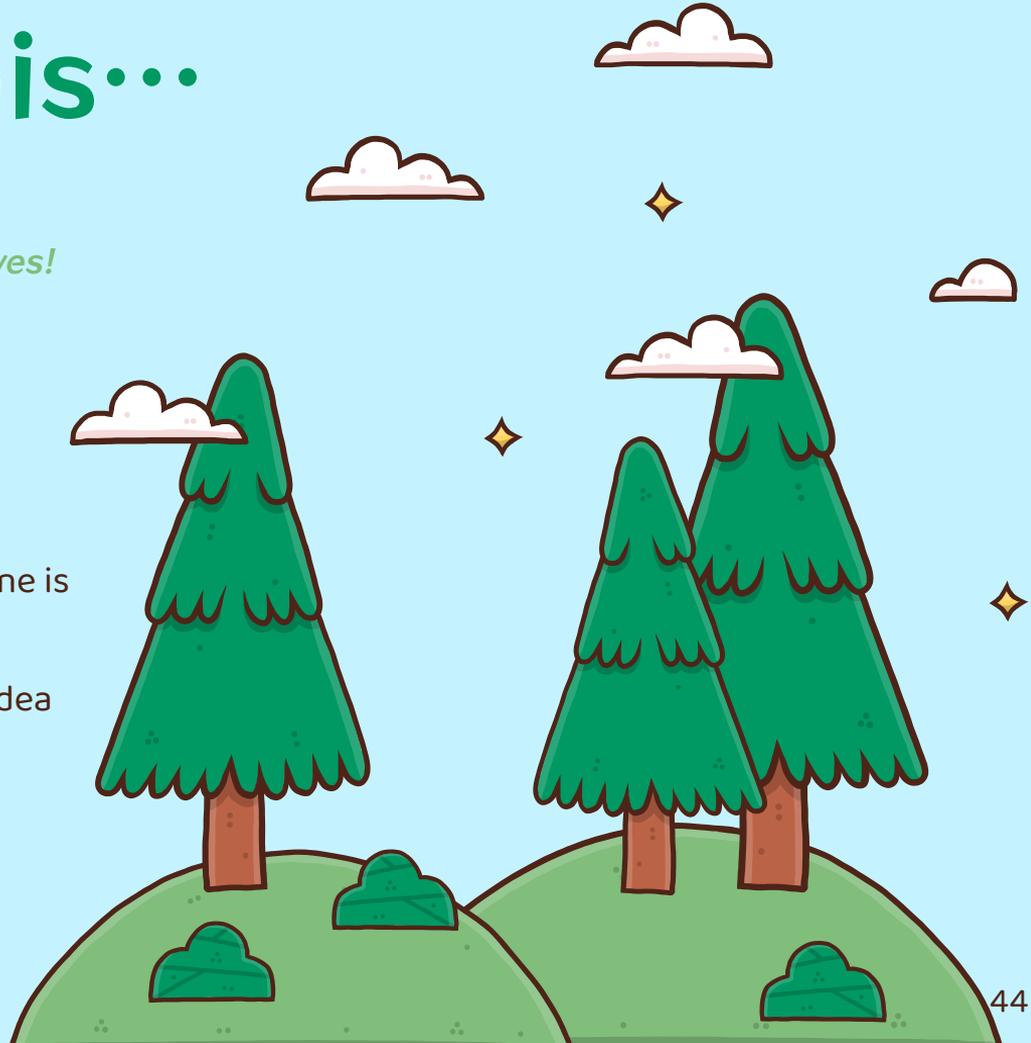
- Materials can be natural or processed
- Matter can change state if heated or cooled
- Solids, liquids and gases have distinct properties
- Melting and freezing points vary depending on the substance
- The water cycle
- Permanent vs. Reversible changes

**\*\*Explore each KUSP with activities, but then relate it back to the story project**

# Let's Try This...

*We are not on an island all by ourselves!*

- 1. Click on the STEP 2 link in the next slide.
  - a. This is a collaborative document (everyone is on the same document)
  - b. Each chart is for a different Organizing Idea
- 2. Fill out any of the 'Grey' areas with ideas, descriptions, or links





# Step 2 - Collaboration



Kindergarten

Grade One



Grade Two

Grade Three



Please feel free to add to these documents



# Resources to Consider

- [Sparkle Box](#)
- [Mystery Science](#)
- [Let's Talk Science](#)
- Sample ["concept introduction" activities](#) (ARPDC)
- [Concept Maps](#) (ARPDC)
- [ARPDC Site](#)
- [Common Sense Education](#)
- Coming Soon from ARPDC: Curriculum Support Doc that has multiple sample activities for each KUSP line.



The background is a light blue gradient. It is decorated with several stylized white clouds with pink outlines and small pink dots. There are also several green leaves with brown outlines and small green dots. Scattered throughout are small yellow four-pointed stars.

# Leaving With Something!

- Understanding of how to work with a KUSP
- Surface and Deep Phase Learning Planning Documents
- Familiarity with your new curriculum
- Year Plan
- Basic Organizing Idea Plans
- Resources

Jess Oracheski  
SCIENCE CONSULTANT

780-806-9394  
Learning Network Educational Services  
@mrs.o.science

Alberta Regional Consortia

[jess.oracheski@arpdc.ab.ca](mailto:jess.oracheski@arpdc.ab.ca)