Explore the World!

by doing science

using arguments and evidence

“This is cool!”

“I can’t wait to share!”
1. Always be curious.
2. Learn to love learning.
3. Learn from mistakes.
Science is important because it connects to real world experiences and builds curiosity to engage in further thinking.
To appreciate the processes and creativity of science.
Why Learn Science?

Understand nature and its interaction to make informed decisions.
That they take ownership of their own learning.
Science sparks students' curiosity and they feel confident in their learning!
Science is fun, everywhere, and think critically about the world around them.
Group Goal: Spark their interest in learning SCIENCE
### What is Sensemaking?

<table>
<thead>
<tr>
<th>Students</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking</td>
<td>Facilitating</td>
</tr>
<tr>
<td>Collaborating</td>
<td>Walking around</td>
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<tr>
<td>Changing ideas</td>
<td>Asking intentional questions</td>
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<tr>
<td>Oral processing</td>
<td>Being flexible</td>
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<tr>
<td>Investigating</td>
<td>Thinking on the fly</td>
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<tr>
<td>Questioning</td>
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<td>Applying Knowledge</td>
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<td>Listening</td>
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<td>REVISING</td>
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Sensemaking: Working through logic and reasoning by questioning and investigating to draw conclusions.
Sensemaking

- Real life application
- Metacognition
- Critical thinking
- Asking questions
- Research
- Discussion (evidence based)
- Active listening
- Collaboration
- Exploration
- Productive struggle
- Prior knowledge
- Meaning construction
Sensemaking

- Active listening
- Facilitating discussion
- Engaging prior knowledge from lessons
- Discussion / Discord about ideas
- Risk free environment to explore
<table>
<thead>
<tr>
<th>Lesson 3</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G5</th>
<th>G6</th>
<th>G7</th>
<th>G8</th>
<th>G9</th>
<th>G10</th>
<th>G11</th>
<th>G12</th>
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<tbody>
<tr>
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<td>bag + cup + liquid</td>
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<td>Total Before</td>
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<td>Total After/</td>
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<td>bag + cup + liquid + solid</td>
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<tr>
<td>Change After - Before</td>
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</tbody>
</table>
Routines & Strategies

- Teacher's Hat
- Science Circle 100% participate
- Pass the Tray
- Roles 1 2 3 4
- Alone Zone
- Purpose for looking
- White boards
- Consensus
- Drawing models
open discussion
- revised = plan
- change/different

-agree that something went wrong

Set pride/idea aside

Ideas from other groups

We work together to figure things out.

- Repeat an ideas

- Say that again!

Judgment free zone!

Ask?
Neutral Body Language

No laughing!

Collaboration
Our Class Model:

Before:
- Ingredients
- Mixture

During:
- Add heat
- Add time
- Add temperature
- Color, size (got bigger)

After:
- Smaller cakes cooked faster than the big cake
- Small / crunchy?
- Larger / darker
- Coloring less time

What is Science about?
Lesson 3

What: The weight did not change.

93g

Before

93g

What happens when you make a cake?

How: Measured weight with a scale. Data talked.

maybe cake before and after weighs the same.

Lesson 4

What: The weight did change with bubbles.

How: Investigate.

maybe the cake will weigh less before and after.
Lesson 6

What happens when you make a cake.

Lesson 7

How?
Students mix ingredients? Baby Soda to trick a change is temperature.

What?
Could the mixing of the ingredients change the temp?

Temperature can increase or decrease as a result of a change.
Lesson 5

- What - Where did the matter go?
- On your own - place tablet in bag and chill - place water in cup bag
- Close bag then tip water and observe
- How - Watch video
- Do it on your own

Lesson 6

- analyzing the charts
- looking for patterns
- identify if a change has occurred

Lesson 7

- Measured temp before, during and after the interaction.
- What? Not sure?
- Interaction = temperature change
- Cake temp increased
Lesson 5

- Weight does not change after mixing a closed container.
- Bubbles isn’t bad/obstructed.

Lesson 6

- What? If the original substance is the same as it was something different.
- What? If the cake changed, what did it change into?
- What? Data observation, sketches from Lesson 3.113.

Lesson 7

- Temperature can increase or decrease as a result.
- Of a change (mixture, bubbles).

Before
- 76°C
- During
  - 30 sec: 31.3°C
  - After
  - decreased
  - 10°C

Maybe the cake mixture is cooler than before mixing the ingredients.

Bubbles that were in the size of cake after it was done baking.
What
Mass Change
weight
matter

How
measure before and after investigation
compare closed and open system

the mass didn't change with bag cloud

What
The temp. Changed from before mixing to after mixing.

Measure temperature every 30 sec.

Temp. Changes the Cake

Take temp before and during a chemical reaction.

Compare data in a table

If original neseans from lessons 3-5 are the same or something different, gain or lose or mix.
Academic Language

Substance
New substance
Irreversible
Property

Irreversible change
Chemical

Open system

Color
Odor
Taste/smile
Hard
Soft
Crunchy

Lid
The argument was a chemical change.

<table>
<thead>
<tr>
<th>Evidence/Info for:</th>
<th>Evidence/Info against:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* bubbles</td>
<td></td>
</tr>
<tr>
<td>* change in temperature</td>
<td></td>
</tr>
<tr>
<td>* fizzing sound</td>
<td></td>
</tr>
</tbody>
</table>
What must we show + tell?

Parts
- bag/bottle
- pot
- ice water
- hot water
- air
- open bottle
- closed bottle
- heat source

Interactions
\[ \rightarrow \text{ bigger } + \text{ pot } \]

Before, heat after heat during heat
Lesson 1D: Beginning to think about air.

- caused the bag to change air.
- a few moments after heating, same puffiness as before.
- very puffy right after heating.
- some puffiness before heat.
- could still touch fingers.
What caused the bottle to change?

Amount of air doesn’t change because it is a closed system. There is air outside too.

Lesson 11: Consensus model