Building a repertoire of literacy support practices

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Intellectual Engagement

1. Planning for engagement with important science ideas
2. Eliciting students’ ideas
3. Supporting ongoing changes in thinking
4. Pressing for evidence-based explanations

Attention to Equity
The bigger picture: What do students need in order to participate in knowledge production?

- **Relevant and compelling contexts** for seeking out and evaluating new information
- **Skills with variety of public representations** that make their ideas visible and show how new information is being made sense of
- **Scaffolds and specialized routines** for reading texts, preparing to write about explanations and evidence
- **Time and opportunity** for all learners to participate in the on-going refinement of ideas.
Planning for engagement with important science ideas

Relevant and compelling phenomena – complex to explain
Eliciting students’ ideas and adapting instruction

Helping students communicate in forms distinctive to science (and making thinking visible)
Eliciting students’ ideas and adapting instruction

2.

WALL

1. He runs towards the wall.

2. He uses the power of his legs as he puts his feet on the wall.

3. His legs are in the center of gravity.

4. His legs are open as he lands.

5. He is back on the ground.

GROUND

By: Tralonda, Michael Paradise and Myt
Supporting on-going changes in thinking

Scaffolded reading experiences—”Dear science colleagues, this is do-able”
Supporting on-going changes in thinking

After reading, activity, investigations—returning to models and explanations

Figure 6c. Students’ summary table to make sense of and coordinate D2 activities
Scaffolding writing about model revisions

**REVISE**
Part of an idea: supports PART of our model, but we would like to change _______ to make it more accurate.

**ADD**
a New idea: supports our model, but it also tells us that should be added to make it even more accurate.

**REMOVE or find out more:**
**We think** (evidence from summary table) contradicts in our original model, and that we need to remove or find out more about it.

**QUESTIONS:**
"We still have questions about _______."
Slowing down, providing time to think and compose feedback to peers.
Pressing for evidence-based explanations

Scaffolds for writing about causal and evidence-based explanations—drawing in multiple ideas and activities to fashion arguments

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4. Planning for engagement with important science ideas

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Structure!

$\text{Rehearsals!}$

Pre-thinking & Pre-writing

Baby Steps
Supportive structures to encourage explanatory writing

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Get Started</strong></td>
<td>Set up the materials and get ready to start.</td>
</tr>
<tr>
<td>2. <strong>Get into the Wall</strong></td>
<td>Begin moving up the wall, applying force.</td>
</tr>
<tr>
<td>3. <strong>Stay on the Wall Momentarily</strong></td>
<td>Maintain a stable position, adjusting as needed.</td>
</tr>
<tr>
<td>4. <strong>Get Higher up the Wall</strong></td>
<td>Continue moving up, increasing force as necessary.</td>
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<tr>
<td>5. <strong>Complete the Flip</strong></td>
<td>Perform a flip, using momentum to continue upward.</td>
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<tr>
<td>6. <strong>Return to the Ground</strong></td>
<td>Slow down and step down, applying controlled force.</td>
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</tbody>
</table>

**EXPLAINING FORCES IN MOTION**

1. **Start:** Traction is the force between the feet and the ground. It is necessary for motion.
2. **Understanding forces:** The force of friction acts against the motion. The force of gravity pulls you down.
3. **Newton's laws:** The first law states that an object in motion stays in motion if there is no force acting on it. The second law relates force, mass, and acceleration.
4. **Applying forces:** Apply forces at the correct points to change the object's motion.
5. **Calculating:** Use the formula \( F = ma \) to calculate the force needed for a given situation.
6. **Solving problems:** Practice solving problems to apply these concepts in real-world scenarios.