Effective Intervention Strategies - Let’s Hook Students into Learning

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STEMscopes at NSTA Portland, OR  -  October 29, 2021

Learning Goals

• Explore several intervention strategies to help *struggling students* in science.

• Use differentiation and scaffolding strategies to support *all students*.

• Support *students’ identity* by using Social-Emotional-Learning strategies.

Special thanks to Stacey O’Connor for the development of this session.
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Zoom In + Zoom Out

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Let's remember ... our current situation

- Many students are frustrated and overwhelmed.
- Students and parents can feel as if they are falling behind.
- Recent pandemic has increased interrupted learning.
- Recent pandemic has increased poor attendance.
**TURN AND TALK:**

**WHAT IS THE **DIFFERENCE** BETWEEN STRATEGY AND INTERVENTION?**

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**Strategy**

The combination of research-based methods or activities designed to teach the learning objective.

**Intervention**

Program, actions, or strategies specifically **designed to address an identified deficiency** and monitored to ensure outcome improvement. Also can be **enrichment**.
Differentiation

https://www.youtube.com/watch?v=GkZUXdT0WcY

How can you differentiate by Content, Process, and Product?

CONTENT (MATERIALS USED)

PROCESS (HOW IT IS TAUGHT)

PRODUCT (WHAT IS PRODUCED)

JIGSAW
Content means the knowledge, understanding, and skills (KUD) that students need to learn (Tomlinson & Imbeau, 2010)

- Using reading materials at varying readability levels.
- Having text materials on audio.
- Using spelling or vocabulary lists at readiness levels of students.
- Presenting ideas through both auditory and visual means.
- Using reading buddies.
- Meeting with small groups to re-teach an idea or skill for struggling learners, or to extend the thinking or skills of advanced learners.

Process is defined as “how students come to understand and make sense of the content” (Tomlinson and Imbeau, 2010)

1. Using tiered activities through which all learners work with the same important understandings and skills, but proceed with different levels of support, challenge, or complexity.
2. Providing interest centers that encourage students to explore subsets of the class topic of particular interest to them.
3. Developing personal agendas (task lists written by the teacher and containing both in-common work for the whole class and work that addresses individual needs of learners) to be completed either during specified agenda time or as students complete other work early.
4. Offering manipulatives or other hands-on supports for students who need them.
5. Varying the length of time a student may take to complete a task in order to provide additional support for a struggling learner or to encourage an advanced learner to pursue a topic in greater depth.
TIPS: Differentiation (class) and Intervention (student)

PRODUCT

Products are ways for students to “demonstrate what they have come to know, understand, and be able to do after an extended period of learning” (Tomlinson & Imbeau, 2010)

1. Giving students **options of how to express** required learning (e.g., create a puppet show, write a letter, or develop a mural with labels).
2. Using **rubrics** that match and extend students' varied skills levels.
3. Allowing students to **work alone** or in **small groups** on their products.
4. Encouraging students to **create their own product** assignments as long as the assignments contain required elements.

VOCABULARY
**TIP: Effective Vocabulary Direct Instruction**


- Presenting individual terms and their descriptions in *rich contexts*.
- Using *multimedia methods* (words, pictures, animations, etc.) to introduce and practice terms.
- Asking students to *relate new terms* to words they already know.
- Providing *multiple exposures* to new terms and opportunities to use those terms in the classroom.

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**VOCABULARY DEFINITION CARDS**
CHEF’S CAP - LET’S GET CREATIVE

1. Divide students into groups.
2. Write science vocabulary word, science topic or inquiry question on large piece of paper.
3. Rotate the papers among the small groups and have them draw images and write words and phrases to depict the word or answer the question.
4. Have students choose a graffiti wall to share.
5. Display graffiti walls as a visual.
MULTIMEDIA

MAKE A PAPER SLIDE CLASS VIDEO

1. Have students listen to the Science Rock video. (without viewing pictures)
2. Cut up lyrics and have the students work together to create their own illustrations of the Science Rock video lyrics.
3. Create a class video of all of the pictures in a paper slide video.

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GET MOVING!

1. Divide students into groups.
2. Have students create movements to a portion of song lyrics.

LITERACY
A-E-I-O-U STRATEGY

A for adjective – a word or two that describes something they saw or learned.

E for emotion – describe how a particular part of the segment made them feel.

I for interesting – write something interesting about the content or the topic.

O for oh! – describe something that caused them to say oh!

U for umm? – identify something that prompts a question in their mind.
Science Sentence Starters

I wonder... _______  This model shows... _______
I observed... _______  A pattern that I noticed... _______
I noticed... _______  I conclude... _______
I predict... _______  A question I still have is... _______
The cause of ____________ on ____________ was __________
The effect of ____________ on ____________ was __________
Our data shows ____________
The similarities between _______ and _______ are _______
The differences between _______ and _______ are _______
Scaffold your questions
Aimed at entire class

Scaffold your questions
Aimed at entire class

Scaffold your questions
Aimed at entire class

Scaffold your questions
Aimed at entire class

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Social Emotional Learning (SEL)

Social Emotional Learning Strategies

- Learn who your students are as individuals.

- Know your students’ learning strengths.
  - practical intelligence
  - creative intelligence
  - analytical intelligence

- Provide students with opportunities to explore key interests.
Ways to Promote Social Emotional Learning

- Morning Meeting
- Check-in questions
- Choose your learning menu
- Surveys to discover learning modalities
### CLASSROOM CULTURE

<table>
<thead>
<tr>
<th>Question</th>
<th>Response 1</th>
<th>Response 2</th>
<th>Response 3</th>
<th>Response 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>What was the biggest highlight of your weekend?</td>
<td>Teach me how to ___________</td>
<td>Praise a peer for showing kindness.</td>
<td>What is one thing you did that helped you be successful this week?</td>
<td>What is one way you could have better used your time this week?</td>
</tr>
<tr>
<td>What is your dream job?</td>
<td>Teach me how to ___________</td>
<td>Praise a peer for being helpful.</td>
<td>What does your schedule look like next week?</td>
<td></td>
</tr>
<tr>
<td>What clothing accessory can’t you live without?</td>
<td>Teach me how to ___________</td>
<td>Praise a peer for using manners.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where is the best place to nap?</td>
<td>Teach me how to ___________</td>
<td>Praise a peer for (student choice).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the best topping for burgers?</td>
<td>Teach me how to ___________</td>
<td>Praise a peer for doing something well.</td>
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<tr>
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</tr>
<tr>
<td>Where is the best place to take a date?</td>
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<tr>
<td>What is the funniest joke you know?</td>
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</tbody>
</table>

### SOCIAL EMOTIONAL LEARNING (SEL) COMPETENCIES

**SELF-AWARENESS**
- Accurately recognizing internal emotions, thoughts, and values and how they influence behavior; accurately assessing one’s own strengths and limitations; and holding a well-grounded sense of confidence, optimism, and a “growth-mindset.”

**SELF-MANAGEMENT**
- Successfully regulating emotions, thoughts, and behaviors in different situations; effectively managing stress, controlling impulsenes, self-motivating, and setting and working toward personal and academic goals.

**SOCIAL AWARENESS**
- Demonstrating and practicing perspective-taking and empathizing with others; understanding appropriate social behavior and recognizing support resources such as family, school, and the community.

**RELATIONSHIP SKILLS**
- Creating and maintaining healthy relationships; communicating and listening effectively; cooperating with others; resisting harmful social pressure, managing conflict constructively; and seeking or providing help when needed.

**RESPONSIBLE DECISION-MAKING**
- Making ethical, constructive decisions with a realistic understanding of consequences and considering the well-being of oneself and others.

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Literature to Support STEM and Social Emotional Learning

Empower Students To:

• **THINK** LIKE A SCIENTIST
• **ACT** LIKE A SCIENTIST
Learning Goals-Revisited

- Explore several intervention strategies to help **struggling students** in STEM.
- Use differentiation and scaffolding strategies to support **all students**.
- Support **students’ identity** by using Social-Emotional-Learning strategies.

Thank You!

Please contact us for any assistance!

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stemscopes.com
References and Resources

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https://www.identitycentered.com/what-is-icl

Robert Marzano’s Six Step Process

To build academic vocabulary

1) **Provide** a description, explanation, or example. Include a visual representation.

2) **Ask** students to put the term into their own words.

3) **Ask** students to construct a visual.

4) **Engage** students periodically in adding experience with the words.

5) Students should **use/speak** the words often.

6) **Involve** students periodically in games that allow them to play with terms.
STEM STRATEGIES

1. Facilitate inquiry-based learning activities.
3. Allow students to collaborate to solve problems.
4. Instill a growth mindset/teach perseverance.
5. Make failure an option/encourage risk taking.
6. Create a student-centered learning environment.
7. Integrate engineering design challenges and/or project-based learning opportunities.
8. Scaffold questions and activities to make learning accessible for all students.
10. Be a role model for students.

SEL

Self-Awareness

Self-Management

Social Awareness

Relationship Skills

Responsible Decision Making

STEM

Growth Mindset, Self-Control, Flexibility

Research, Design, Rubrics, Goals

Empathy, Understanding, Design Thinking

Cooperative Learning, Communication

Problem Solving, Responsibilities