

**100%**  
**Mathematical**

Use regularly in  
the classroom  
learning cycle

# M.V.P.

Most Valuable Practices

# IN MATH

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USE M.V.P. CUBES IN THE  
CLASSROOM AND SCORE  
A "PERFECT 10!"!

## *Using MVP Cubes in the Classroom*

The Common Core State Standards in Mathematics emphasize the mathematical practices, which should be thoughtfully integrated in appropriate ways, not taught as a separate set of skills. These important “habits of mind” help define rich mathematical tasks/problems that students can engage in and develop mathematical literacy.

The following MVP’s (Most Valuable Practices) are an engaging way to utilize the mathematical practices in the classroom, as students encounter rich tasks and problems. They can be used before and/or after working on a problem.

### **WHY USE THE CUBES:**

- 🍷 The MVP cubes are a great assessment tool. Two sets of cubes are included. The first set can be used “before” starting to work on a problem and the second set can be used “after” completing a problem/task.
- 🍷 When students respond to a cube prompt, they are thinking mathematically and developing ways to communicate their thinking and understanding in writing.
- 🍷 The prompts are designed to be quick writes and can be assessed quickly.

### **HOW TO USE THE CUBES:**

Each cube focuses on a different mathematical practice. One set is designed to be used before solving a problem, the other set to be used after solving a problem. There are 16 cubes (one for each practice before and after) and 2 cubes that combine multiple practices onto one cube. (18 cubes total!)

Below are several ways to use the cubes in the classroom.

- 🍷 **Start by modeling!** Use a cube that illustrates a mathematical practice and model a response to a problem as a whole group. Talk about what you are looking for in a response, and how as a class students should think like a mathematician! Once you have modeled, give students an opportunity to respond to a different prompt.
- 🍷 **In small groups:** Give each group a cube (they could all be different) and have them roll the cube to determine the question to answer. They could talk about this as a group and share out whole class, or record a response in a math journal. WE have also included an MVP template that students could use.
- 🍷 **At a center (or individually):** Have students completing a rich task/problem at a center. They can roll a cube (before and/or after) and write their response.
- 🍷 **Whole Class:** The teacher can roll a class cube and pose the prompt to the class. Students can record their thinking in a journal or on a separate sheet of paper.
- 🍷 **Discussion Prompts:** Use these to discuss mathematics with your students. It’s a great formative assessment on how students are thinking and solving mathematics.

## **HOW CUBES ARE DESIGNED & ASSEMBLED:**

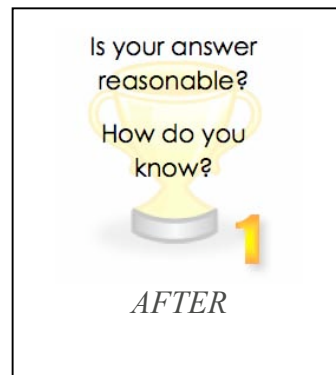
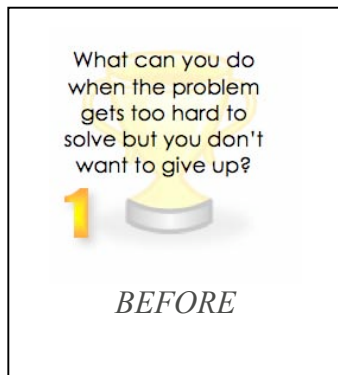
### **Design:**

🏆 There are 6 prompts on each face of the cube. Each prompt is labeled with the number that corresponds to the mathematical practice in the Common Core Standards.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

🏆 All the cubes for “before” solving a problem are together in the packet, and all the cubes for “after” solving a problem are together. In case you cut them up and can’t remember which is which, here’s an easy trick!

The cubes for “before” have the number on the right hand side (think before the text), and the cubes for “after” have the number on the left hand side (think after the text).



### **Tips to Make the Cubes:**

🏆 Copy each cube onto cardstock. Cut out around the cube and fold on the lines. Fold each side up and tape flaps to secure the cube.

🏆 You can also copy onto colored copy paper and laminate. Assemble cubes after you laminate for durability.

🏆 Use two colors of paper for the cubes. One color for “before” and one color for “after”. This is an easy way to know which cube to use with students.

## **How To Assess Student Thinking and the Mathematical Practices**

Learning to understand the mathematical practices is a journey. The more you use and reflect on them, the better understanding you will develop and the stronger math “habits of mind” your students will have. Eventually you will observe students using several practices, because they all tend to overlap on another.

As you work with your students on problem solving in your mathematics classroom, it is important to remember that you are facilitating the lesson. Included in this packet are **GOAL CHARTS** (Gathering Observations to Assess Learning) that will help you focus on recording observations of student understanding while they work with the mathematical practices.

There are eight separate GOAL Charts, one for each of the mathematical practices. At the top of each chart are the questions that are on the “before/during” cubes and the “after” cubes. These questions are there for you to select as you observe and facilitate a problem-solving lesson. You might highlight the questions you want to focus on for the day or use them randomly as needed.

After you launch the problem, select 5 or more students to assess for the day. Step back and observe your students as they explore the problem. Your goal is to gather evidence to assess learning on the GOAL Chart. You can also use the BEFORE/DURING questions to facilitate students who are having difficulties. Remember it is okay for students to “struggle” a bit when solving problems, and the questions included on the cubes can help students clarify their thinking, and keep you in the observer mode.

### **Use the GOAL Chart to:**

- 🍷 collect evidence of pictures, numbers, words that students use to solve problem
- 🍷 record comments, and questions students ask as they explore and solve the problem.
- 🍷 write and record what you see and hear. This is often where you can find and select students to share their mathematical thinking.
- 🍷 look for different solutions, different representations, or how students explained their reasoning in different ways.
- 🍷 Identify students who can share different perspectives. This will foster their ability to critique the reasoning of others.

# ORGANIZATION OF PACKET

## **Information on the Mathematical Practices in the Common Core Standards**

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

## **MVP Cubes to use BEFORE solving problems**

## **MVP Cubes to use AFTER solving problems**

## **Assessing Using the GOAL Charts: Gathering Observations to Assess Learning**



***Make sense of problems and persevere in solving them.***

**Mathematically proficient students:**

- 🏆 explain to themselves the meaning of a problem and looking for entry points to its solution.
- 🏆 analyze givens, constraints, relationships, and goals.
- 🏆 make conjectures about the form and meaning of the solution attempt.
- 🏆 consider analogous problems, and try special cases and simpler forms of the original problem.
- 🏆 monitor and evaluate their progress and change course if necessary.
- 🏆 transform algebraic expressions or change the viewing window on their graphing calculator to get information.
- 🏆 explain correspondences between equations, verbal descriptions, tables, and graphs.
- 🏆 draw diagrams of important features and relationships, graph data, and search for regularity or trends.
- 🏆 use concrete objects or pictures to help conceptualize and solve a problem.
- 🏆 check their answers to problems using a different method.
- 🏆 ask themselves, "Does this make sense?"
- 🏆 understand the approaches of others to solving complex problems.

*~The above bullet points are from the Common Core State Standards, Mathematical Practices*

**Teachers should:**

- 🏆 provide tasks that provide multiple entry points and solutions
- 🏆 work on procedural fluency and conceptual fluency
- 🏆 ask students to justify and defend their mathematical thinking
- 🏆 give opportunities for students to check their solutions and compare their solutions
- 🏆 check in with students to clarify their thinking
- 🏆 give opportunities for students to compare approaches to problems with others





**USE THIS SET OF  
CUBES  
BEFORE & DURING  
PROBLEM SOLVING**

**M.V.P.  
MOST VALUABLE  
PRACTICES**



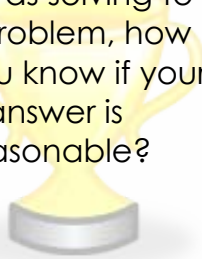
What might you do first to solve this problem?

1



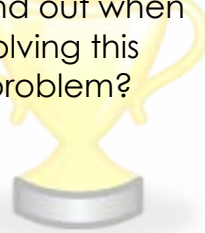
As you work towards solving to this problem, how will you know if your answer is reasonable?

1



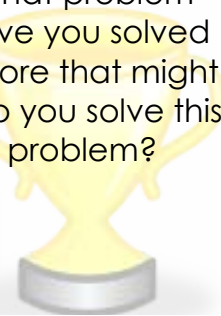
What is the question you need to find out when solving this problem?

1



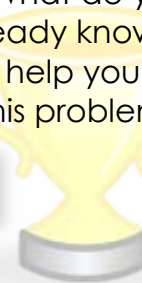
What problem have you solved before that might help you solve this problem?

1



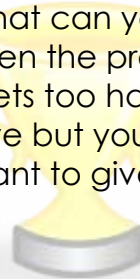
What do you already know that will help you solve this problem?

1



What can you do when the problem gets too hard to solve but you don't want to give up?

1

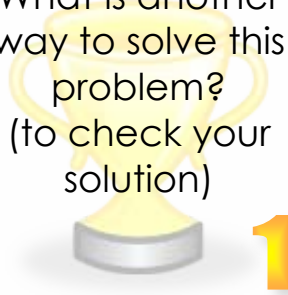




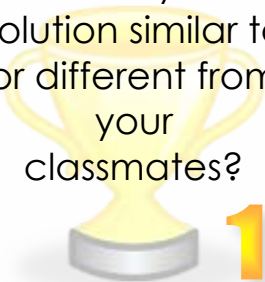
**USE THIS SET OF  
CUBES  
AFTER  
PROBLEM SOLVING**

**M.V.P.  
MOST VALUABLE  
PRACTICES**

What is another way to solve this problem?  
(to check your solution)



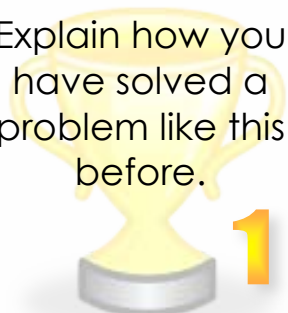
How is your solution similar to or different from your classmates?



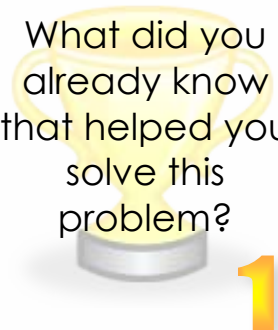
Is your answer reasonable?  
How do you know?



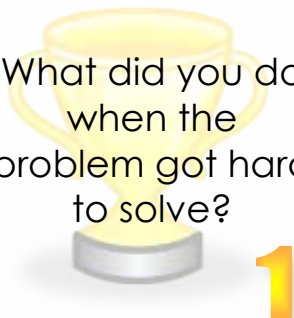
Explain how you have solved a problem like this before.



What did you already know that helped you solve this problem?



What did you do when the problem got hard to solve?





Name: \_\_\_\_\_

M.V.P.



Cube Number: \_\_\_\_\_

Cube Question:

Your Answer:



Use these Observation Sheets to



**(Gathering Observations to Assess Learning)**

## GOAL CHART (Gathering Observations to Assess Learning)

<b>Mathematical Practice: 1. Making Sense of Problems and persevere in solving them.</b>	
<b><i>MVP Cube Prompts BEFORE/DURING</i></b>	<b><i>MVP Cube Prompts AFTER</i></b>
<ul style="list-style-type: none"> <li>👉 What might you do first to solve this problem?</li> <li>👉 How will you know if your answer is reasonable?</li> <li>👉 What is the question you need to find out when solving this problem?</li> <li>👉 What problem have you solved before that might help you?</li> <li>👉 What do you already know that will help you solve this problem?</li> <li>👉 What can you do when the problem gets too hard to solve but you don't want to give up?</li> </ul>	<ul style="list-style-type: none"> <li>👉 What is another way to solve this problem?</li> <li>👉 How is your solution similar to or different from your classmates?</li> <li>👉 Is your answer reasonable? How to you know?</li> <li>👉 Explain how you have solved a problem like this before.</li> <li>👉 What did you already know that helped you solve this problem?</li> <li>👉 What did you do when the problem gets too hard to solve but you don't want to give up?</li> </ul>

<b>Student</b>	<b>Gathering Observations to Assess Learning</b>
<b>1.</b>	
<b>2.</b>	
<b>3.</b>	
<b>4.</b>	
<b>5.</b>	
<b>6.</b>	

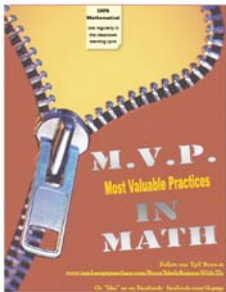


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REST OF THE FILE, WHICH INCLUDES INFO, CUBES, AND GOAL  
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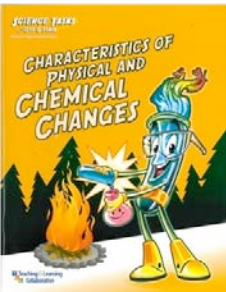
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