Connecting to the Process Standards in Math

Courtney Lopez & Shannon Taylor
Warm Up

What do you notice?

What do you wonder?

If you can correctly order decimals:

Plan

look over each answer and see if it's greatest to least

D is the distractor because if other people didn't read the question all the way

The correct answer is: C

numbers are not in order from least to greatest

(arbitrarily is out of order)
Learning Target:
I can use process standards as a tool to connect to the curriculum, connect teacher to the students, and connect the students to each other
Question:
How do you use the process standards in your teaching and planning?
Teachers and Curriculum Connecting
4 Big Ideas found in Process Standards

Problem Solving (standards A & B)  Representations (standard D & E)
Tools & Techniques (standard C)  Communication (standard F & G)

<table>
<thead>
<tr>
<th>Tools to Know</th>
<th>Ways to Show</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.1(A)</strong> apply mathematics to problems arising in everyday life, society, and the workplace</td>
<td><strong>5.1(D)</strong> communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate</td>
</tr>
<tr>
<td><strong>5.1(B)</strong> use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution</td>
<td><strong>5.1(E)</strong> create and use representations to organize, record, and communicate mathematical ideas</td>
</tr>
<tr>
<td><strong>5.1(C)</strong> select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems</td>
<td><strong>5.1(F)</strong> analyze mathematical relationships to connect and communicate mathematical ideas</td>
</tr>
<tr>
<td><strong>5.1(G)</strong> display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication</td>
<td></td>
</tr>
</tbody>
</table>
Unpack TEKS w/ Process Standards

K-2

1.5D: **Algebraic Reasoning**: The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships: represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences.

https://www.youtube.com/watch?v=-9TMUVJb4Eo&t=122s
Unpack TEKS w/ Process Standards

3-5

4.5A: Algebraic Reasoning: The student applies mathematical process standards to develop concepts of expressions and equations: represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity

https://www.youtube.com/watch?v=-9TMUVJb4Eo&t=122s
# Planning with Process Standards in Mind

**Teacher’s Mind:** Choosing tasks with process standards in mind

<table>
<thead>
<tr>
<th>Math</th>
<th>Intervention</th>
<th>Process &amp; Knowledge Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monday</strong></td>
<td><strong>Tuesday</strong></td>
<td><strong>The student …</strong></td>
</tr>
<tr>
<td><strong>Learning Target</strong></td>
<td><strong>TEK- Lesson</strong></td>
<td>- applies mathematical process standards</td>
</tr>
<tr>
<td><strong>Lesson-</strong> Fireflies</td>
<td><strong>Tutoring</strong></td>
<td>- apply math to problems from everyday life</td>
</tr>
<tr>
<td><strong>Mini-Lesson-</strong></td>
<td></td>
<td>- use problem-solving model</td>
</tr>
<tr>
<td><strong>Workshop-</strong></td>
<td></td>
<td>- analysing given information</td>
</tr>
<tr>
<td><strong>Debrief-</strong></td>
<td></td>
<td>- form a plan</td>
</tr>
<tr>
<td><strong>Resources and Materials-</strong></td>
<td></td>
<td>- determine a solution</td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td></td>
<td>- justify a solution</td>
</tr>
</tbody>
</table>

- solves positive rational numbers fluently
- uses problem-solving model
- analysing given information
- forms a plan
- determines a solution
- justifies a solution
- evaluates problem solving process
- selects tools
- communicates mathematical ideas
- creates and uses representations
- analyzes math relationships
- displays math ideas
- explains math ideas
- writes communication
- speaks communication
- develops and uses strategies and methods
- computes positive rational numbers
- solves problems with efficiency and accuracy.
Planning with Process Standards in Mind

Turn & Talk & Share

- Do you have any thoughts about this process? Questions?
- How do you incorporate the process standards with the content standards during your planning?
- Has something else worked really well for you, that you wouldn’t mind sharing with us today?
Rich Tasks: take the resources you have and make them rich with the process standards! Think smarter not harder!

- **Lead4ward Activities**
  - [https://lead4ward.com/playlists/](https://lead4ward.com/playlists/)

- **UbD Tasks**

- **Esti Mysteries (rich warm up task)**
  - [https://www.stevewyborney.com/?p=1744](https://www.stevewyborney.com/?p=1744)

- **STAAR Review Tasks (from Rockwall ISD)**
Resources

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- **STAAR Review Tasks (from Round Rock ISD)**
  - 3rd Grade - https://docs.google.com/document/d/1qsYt9llipLapHsGiKLZFYVav7AAtWd9zCM-QN772tr4/edit
  - 4th Grade - https://docs.google.com/document/d/1d0NCsvliYPN8_3o6Koj2P9zczs0KTdDREcFcuG-DH9Q/edit
  - 5th Grade - https://docs.google.com/document/d/1qcQ2uEzssC7M1s5HW-HEEPaypa5xQB6DhGzuO9LQhgg/edit

- **Numberless Word Problems**
  - https://bstockus.wordpress.com/numberless-word-problems/
Teachers and Students Connecting
Connecting Process Standards to Student Minds

Student’s Mind

Visible Connections:

- Anchor Chart each unit
- Charts around the Room
Connecting Process Standards to Student Minds

Student’s Mind

Activities to Connect:

Notice |
---|
Numbers count by 50 along X-axis |
Bar graph with numbers |
Letters M - 75 N - 125 P - 150 highest = Q - 175 lowest = R - 50
Columns count by 25
Y axis is neighborhoods
Data shows garbage cans being emptied

Wonder |
---|
What letters for? |
Is there a unit? |
Why doesn’t it have a key? |
Notice? Wonder?
The graph below shows the number of garbage cans that were emptied in five neighborhoods.

Which statement is best supported by the information in the graph?

A  A total of 500 garbage cans were emptied in these 5 neighborhoods.
The graph below shows the number of garbage cans that were emptied in five neighborhoods.

The combined number of garbage cans emptied in Neighborhood M and Neighborhood N is 50 more than the number of garbage cans emptied in Neighborhood P.
The graph below shows the number of garbage cans that were emptied in five neighborhoods.

Garbage Cans Empty

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>M</td>
<td>60</td>
</tr>
<tr>
<td>N</td>
<td>120</td>
</tr>
<tr>
<td>P</td>
<td>150</td>
</tr>
<tr>
<td>Q</td>
<td>180</td>
</tr>
<tr>
<td>R</td>
<td>40</td>
</tr>
</tbody>
</table>

Which statement is best supported by the information in the graph?

C. The difference between the greatest number of garbage cans emptied and the least number of garbage cans emptied is 110.
The graph below shows the number of garbage cans that were emptied in five neighborhoods.

Garbage Cans Empty

<table>
<thead>
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<tr>
<td>M</td>
<td>50</td>
</tr>
<tr>
<td>N</td>
<td>100</td>
</tr>
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<td>150</td>
</tr>
<tr>
<td>Q</td>
<td>200</td>
</tr>
<tr>
<td>R</td>
<td>60</td>
</tr>
</tbody>
</table>

Which statement is best supported by the information in the graph?

D. The combined number of garbage cans emptied in Neighborhood P and Neighborhood Q is 375 more than the number of garbage cans emptied in Neighborhood R.
The graph below shows the number of garbage cans that were emptied in five neighborhoods.

![Garbage Cans Emptyied](image)

Which statement is best supported by the information in the graph?

A. A total of 500 garbage cans were emptied in these 5 neighborhoods.

B. The combined number of garbage cans emptied in Neighborhood M and Neighborhood N is 50 more than the number of garbage cans emptied in Neighborhood P.

C. The difference between the greatest number of garbage cans emptied and the least number of garbage cans emptied is 110.

D. The combined number of garbage cans emptied in Neighborhood P and Neighborhood Q is 375 more than the number of garbage cans emptied in Neighborhood R.
Resources

Rich Tasks: take the resources you have and make them rich with the process standards! Think smarter not harder!

- Lead4ward Activities
  - [https://lead4ward.com/playlists/](https://lead4ward.com/playlists/)
  - My Favorites:
    - Toss a Question
    - Shake and Share
    - Tour of Knowledge
    - Make the Case
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Toss a Question / Gallery Rounds

Round 1: What is the BIG IDEA of the question?

Round 2:

Round 3:

Round 4:

Round 5:

Round 6:
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● Numberless Word Problems
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Share Out:
What have you tried in your classroom to get your students analyzing, thinking, connecting to their mathematics at a deeper level?

Or what have you found today that you want to try in your classroom?
Students and Students Connecting
# Peer Feedback Dialogue Form

<table>
<thead>
<tr>
<th>Assessment Dialogue Form—Partner A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong></td>
</tr>
<tr>
<td><strong>Date:</strong></td>
</tr>
</tbody>
</table>

**Assignment:** Create a Line Graph  
**Feedback Focus:** all sections

**MY OPINION**

My strengths are: 

What I think I need to work on is: 

**MY TEACHER’S FEEDBACK**

Strengths: 

Work on: 

**MY PLAN**

What I will do now: 

Adapted from Seven Strategies of Assessment for Learning, 2e, Figure 3.16, p. 121.