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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Monday-** | **Tuesday-** | **Wednesday-** | **Thursday-** | | **Friday-** |  |
| **Pre-Planning: Unpacking the Standards** | **TEKS:**  (R) - Readiness Standard  (S) -Supporting Standard  **ELPS** (Language Objective) | Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:  MATH.6.1A Apply mathematics to problems arising in everyday life, society, and the workplace  MATH.6.1B 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.  MATH.6.1C 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.  MATH.6.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.  MATH.6.1E Create and use representations to organize, record, and communicate mathematical ideas  MATH.6.1F Analyze mathematical relationships to connect and communicate mathematical ideas  MATH.6.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication. | Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. 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| **Verb(s)**  - What verbs define the actions students will need to take? | Apply  Use  Select  Communicate  Create  Analyze  Display | Apply  Use  Select  Communicate  Create  Analyze  Display | Apply  Use  Select  Communicate  Create  Analyze  Display | Apply  Use  Select  Communicate  Create  Analyze  Display | | Apply  Use  Select  Communicate  Create  Analyze  Display |  |
| **Vocabulary**  (Academic and Content) | Analyze  Evaluate  Formulate  Inferences  Justify  Problem-Solving Model  Plan  Predictions  Process  Reasonable  Solution  Strategy  Visualization | Analyze  Evaluate  Formulate  Inferences  Justify  Problem-Solving Model  Plan  Predictions  Process  Reasonable  Solution  Strategy  Visualization | Analyze  Evaluate  Formulate  Inferences  Justify  Problem-Solving Model  Plan  Predictions  Process  Reasonable  Solution  Strategy  Visualization | Analyze  Evaluate  Formulate  Inferences  Justify  Problem-Solving Model  Plan  Predictions  Process  Reasonable  Solution  Strategy  Visualization | | Analyze  Evaluate  Formulate  Inferences  Justify  Problem-Solving Model  Plan  Predictions  Process  Reasonable  Solution  Strategy  Visualization |  |
| **Lesson Topic** (Content Objective) | Introduction to Problem Solving/First Day of School Procedures | Introduction to Problem Solving | Strengthening Problem Solving | Strengthening Problem Solving | | Strengthening Problem Solving |  |
| **ELPS** (Language Objective) | ELPS C.1e Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.  ELPS C.4d Use pre-reading supports such as graphic organizers, illustrations, and pre-taught topic-related vocabulary and other pre-reading activities to enhance comprehension of written text.  ELPS C.2f Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment. | ELPS C.1e Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.  ELPS C.4d Use pre-reading supports such as graphic organizers, illustrations, and pre-taught topic-related vocabulary and other pre-reading activities to enhance comprehension of written text.  ELPS C.2f Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment. | ELPS C.1e Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.  ELPS C.4d Use pre-reading supports such as graphic organizers, illustrations, and pre-taught topic-related vocabulary and other pre-reading activities to enhance comprehension of written text.  ELPS C.2f Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment. | | ELPS C.1e Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.  ELPS C.4d Use pre-reading supports such as graphic organizers, illustrations, and pre-taught topic-related vocabulary and other pre-reading activities to enhance comprehension of written text.  ELPS C.2f Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment. | ELPS C.1e Internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.  ELPS C.4d Use pre-reading supports such as graphic organizers, illustrations, and pre-taught topic-related vocabulary and other pre-reading activities to enhance comprehension of written text.  ELPS C.2f Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment. |  |
| **Lesson Cycle** | **Engage:**  **Warm-Up/Opening (min)** | Have you ever forgotten your lunch? What did you do?  Have you ever been unable to do your homework because you didn't understand it? What did you do?  Have you ever had difficulties in a friendship with someone? What did you do?  Why do you think problem solving and critical thinking always appear on lists of the most important 21st century skills? | Have you ever forgotten your lunch? What did you do?  Have you ever been unable to do your homework because you didn't understand it? What did you do?  Have you ever had difficulties in a friendship with someone? What did you do?  Why do you think problem solving and critical thinking always appear on lists of the most important 21st century skills? | What is your problem solving story?  Many famous mathematicians began by studying one problem ... write about an event in your own life where you used problem solving strategies to help guide your decision making process.  To help craft your story, be sure to include answers to the following questions:  1. What was the situation you were facing?  2. What did you know about the situation you were facing? What were some specific details?  3. What steps did you take as you made your decisions regarding the situation? In other words, how did you solve the problem?  4. Why did you solve the problem in that way?  5. Were there any changes you made along the way based on those steps?  6. What was the resolution or outcome to the situation?  7. What would you have done differently if you could have gone back and done it over again? | What is your problem solving story? (continued)  Many famous mathematicians began by studying one problem ... write about an event in your own life where you used problem solving strategies to help guide your decision making process.  To help craft your story, be sure to include answers to the following questions:  1. What was the situation you were facing?  2. What did you know about the situation you were facing? What were some specific details?  3. What steps did you take as you made your decisions regarding the situation? In other words, how did you solve the problem?  4. Why did you solve the problem in that way?  5. Were there any changes you made along the way based on those steps?  6. What was the resolution or outcome to the situation?  7. What would you have done differently if you could have gone back and done it over again? | | What is your problem solving story? (continued)  Many famous mathematicians began by studying one problem ... write about an event in your own life where you used problem solving strategies to help guide your decision making process.  To help craft your story, be sure to include answers to the following questions:  1. What was the situation you were facing?  2. What did you know about the situation you were facing? What were some specific details?  3. What steps did you take as you made your decisions regarding the situation? In other words, how did you solve the problem?  4. Why did you solve the problem in that way?  5. Were there any changes you made along the way based on those steps?  6. What was the resolution or outcome to the situation?  7. What would you have done differently if you could have gone back and done it over again? |  |
| **Explore:**  **Review (min):** | What type of strategies do you think scientists, engineers, and mathematicians use when solving problems? How are their strategies similar to those that you use?  Watch: <https://www.youtube.com/watch?v=C2YZnTL596Q>  In your small group, discuss the following questions and be prepared to share with the class:  1. What are some situations of "fitting a square peg in a round hole" in real life?  2. What are some strategies that students or their parents use to make decisions that affect their lives?  3. Why is it important to think clearly and be organized when solving a problem and not just a mathematics problem? | What type of strategies do you think scientists, engineers, and mathematicians use when solving problems? How are their strategies similar to those that you use?  Watch: <https://www.youtube.com/watch?v=C2YZnTL596Q>  In your small group, discuss the following questions and be prepared to share with the class:  1. What are some situations of "fitting a square peg in a round hole" in real life?  2. What are some strategies that students or their parents use to make decisions that affect their lives?  3. Why is it important to think clearly and be organized when solving a problem and not just a mathematics problem? | Try the Frog Puzzle: <http://www.hellam.net/maths2000/frogs.html>    To goal is to get all the yellow frogs to the right side of the pond and to send all the red frogs to the left side of the pond - in as few moves as possible.  In your small group, discuss the following questions and be prepared to share with the class:  1. How many moves did it take to get all the frogs to the opposite side?  2. What are some strategies that you used to determine which frog you would move?  3. Why is it important to think clearly and be organized when solving a problem ... and not just a mathematics problem?  4. How does this activity relate to problem solving in real life? | In your small group, discuss the following questions and be prepared to share with the class:  Andrew and Kelley were reading the same book in class. Andrew asked Kelley what page she was on. Kelley said that Andrew would have to figure it out using these clues:  1. When she put down the book for lunch, she noticed that the product of the two facing page numbers was 32,580.  2. Kelley said that the last page she read was an odd number page.  What was the last page Kelley read before lunch?  Hints: create a table (odd number, even number, product, comment), guess and check | | In your small group, use the problem solving format and discuss the following questions and be prepared to share with the class:  3 monkeys lived on an island and hunted for food together. They put all of the coconuts they found in a large pile and went to sleep.  During the night, the first monkey woke up hungry. He ate one coconut, then he divided the rest of the coconuts into three equal piles. He pushed two piles back together, then took the third pile off into the forest to eat some more before returning to bed.  After a short time, the second monkey woke up hungry. He ate one coconut and then he divided the rest of the coconuts into three equal piles. He pushed two piles back together, then took the third pile off to the beach to eat some more before returning to bed.  Soon the third monkey woke up, went to the pile of coconuts and were surprised to only see 6 coconuts left. “I know there were more than this yesterday,” said the monkey. The other two nodded in agreement. “I only took a couple last night,” the first and second monkey said.  1. How many coconuts were in the pile before the monkeys went to bed?  2. How many coconuts did each monkey actually take? |  |
| **Explain:**  **Guided Practice (min):** | Being a Mathematics Problem Solver  Cooperative Group Behaviors:  Initiating/problem solving  Organizing/coordinating  Seeking  Encouraging  Harmonizing  Clarifying/summarizing  Mathematics Journal Set Up:  Warm ups  Problem Solving  Vocabulary  Reflections/response  Strategies | Being a Mathematics Problem Solver  Cooperative Group Behaviors:  Initiating/problem solving  Organizing/coordinating  Seeking  Encouraging  Harmonizing  Clarifying/summarizing  Mathematics Journal Set Up:  Warm ups  Problem Solving  Vocabulary  Reflections/response  Strategies | Creating a Plan  Cooperative Group Behaviors:  Initiating/problem solving  Organizing/coordinating  Seeking  Encouraging  Harmonizing  Clarifying/summarizing  At Pal-a-Table, a new restaurant in town, there are 24 square tables. One chair is placed on each side of a table. However, Pal-a-Table has a problem. For large groups, they must push some of the tables together to make a longer table. As before, they place one chair on each side of the table. How many tables would be needed for a group of 18 people? | Creating a Plan  Cooperative Group Behaviors:  Initiating/problem solving  Organizing/coordinating  Seeking  Encouraging  Harmonizing  Clarifying/summarizing  CHAMP whole group  “Why do we need rules?”  CHAMP: TPS (“rock, paper, scissors” partner game 30 seconds\*)  TPS Why we need rules.  Introduce my rules. | | Creating a Plan  Cooperative Group Behaviors:  Initiating/problem solving  Organizing/coordinating  Seeking  Encouraging  Harmonizing  Clarifying/summarizing  CHAMP whole group  Monkey Business Solution |  |
| **Elaborate:**  **Independent Practice (min):** | With a partner, solve the following problem using the mathematics problem strategies and the problem solving mat. Remember to interact with each other according to the positive Cooperative Group Behavior expectations.  Max is organizing a trip to take 75 people to the airport. He can use two types of taxis.  -A small taxi costs $40 for the trip and holds up to 4 people.  -A large taxi costs $63 for the trip and holds up to 7 people.  1.(a) If Max orders 6 large taxis, how many small taxis will he need?     (b) How much will the total cost be?  2. Max can organize the journey more cheaply than this! How many taxis of each type should Max order to keep the total cost as low as possible? | With a partner, solve the following problem using the mathematics problem strategies and the problem solving mat. Remember to interact with each other according to the positive Cooperative Group Behavior expectations.  Max is organizing a trip to take 75 people to the airport. He can use two types of taxis.  -A small taxi costs $40 for the trip and holds up to 4 people.  -A large taxi costs $63 for the trip and holds up to 7 people.  1.(a) If Max orders 6 large taxis, how many small taxis will he need?     (b) How much will the total cost be?  2. Max can organize the journey more cheaply than this! How many taxis of each type should Max order to keep the total cost as low as possible? | Problem Solving Strategies: Discuss which strategy/strategies your group thinks would be most helpful in solving this problem.  -guess and check  -draw a picture  -work backwards  -write an equation/use a variable  -act it out  -use a model  -look for a pattern  -make a table or chart  -try a simpler form of the problem  -make a list  Test out your plan and be prepared to justify your solution about the lockers! | Problem Solving Strategies: Discuss which strategy/strategies your group thinks would be most helpful in solving this problem.  -guess and check  -draw a picture  -work backwards  -write an equation/use a variable  -act it out  -use a model  -look for a pattern  -make a table or chart  -try a simpler form of the problem  -make a list  Activity: Each group is assigned one rule. Group creates poster telling what that rule means to them and why important (can use illustrations and words) | | Problem Solving Strategies: Discuss which strategy/strategies your group thinks would be most helpful in solving this problem.  -guess and check  -draw a picture  -work backwards  -write an equation/use a variable  -act it out  -use a model  -look for a pattern  -make a table or chart  -try a simpler form of the problem  -make a list  Activity: Each group is assigned one activity (whole group, independent work, group work, entering class, leaving class). Group creates poster telling what that rule means to them and why important (can use illustrations and words) |  |
| **Evaluate:**  **Closing ( min.):** | On a sticky note, answer the following questions:  1. What is your name and class period?  2. What is one positive experience that occurred during the problem solving process today?  3. What is one area you feel that you can work on or get better at during this school year?  4. My name is \_\_\_ and I am in period \_\_\_.  5. One positive experience that occurred during the problem solving process today was \_\_\_\_.  6. One thing that I can work on getting better at this school year is \_\_\_\_. | On a sticky note, answer the following questions:  1. What is your name and class period?  2. What is one positive experience that occurred during the problem solving process today?  3. What is one area you feel that you can work on or get better at during this school year?  4. My name is \_\_\_ and I am in period \_\_\_.  5. One positive experience that occurred during the problem solving process today was \_\_\_\_.  6. One thing that I can work on getting better at this school year is \_\_\_\_. | On a sticky note, answer the following questions:  1. What is your name and class period?  2. What is one positive experience that occurred during the problem solving process today?  3. What is one area you feel that you can work on or get better at during this school year?  4. My name is \_\_\_ and I am in period \_\_\_.  5. One positive experience that occurred during the problem solving process today was \_\_\_\_.  6. One thing that I can work on getting better at this school year is \_\_\_\_. | Rules Poster Gallery walk.  CHAMP out gallery walks. | | CHAMP Poster gallery walk.  CHAMP out gallery walks. |  |
| **Reinforcement** | **Materials/ Resources:** | Composition Notebook  Problem Solving mat  Sticky notes | Composition Notebook  Problem Solving mat  Sticky notes | Composition Notebook  Frog puzzle (HUB)  Sticky notes | Problem solving format  Butcher paper (1 sheet per group) | | Problem solving format  Butcher paper (1 sheet per group) | |
| **Homework** | Bring 2 Composition Notebooks, 1 Spiral, 1 pack of Index cards, (2) number 2 pencils, 1 ream of copy paper, (1) brad folder | Bring 2 Composition Notebooks, 1 Spiral, 1 pack of Index cards, (2) number 2 pencils, 1 ream of copy paper, (1) brad folder | Bring 2 Composition Notebooks, 1 Spiral, 1 pack of Index cards, (2) number 2 pencils, 1 ream of copy paper, (1) brad folder | Bring 2 Composition Notebooks, 1 Spiral, 1 pack of Index cards, (2) number 2 pencils, 1 ream of copy paper, (1) brad folder | | Bring 2 Composition Notebooks, 1 Spiral, 1 pack of Index cards, (2) number 2 pencils, 1 ream of copy paper, (1) brad folder |  |

**\*All lesson plans are subject to revisions and addendums by teacher.**

**\*This lesson plan is designed to be a guide the teacher can use to engage in thoughtful planning of each lesson, to better integrate vertical alignment opportunities, and to ensure high order thinking opportunities throughout instructional timeframes.**