

LESSON 1: SOLVE – S and O

[OBJECTIVE]

The student will learn and practice the first two steps (S and O) in the SOLVE problem-solving method.

[MATERIALS]

Student pages **S1–S6**

Transparencies **T10, T11, T13**

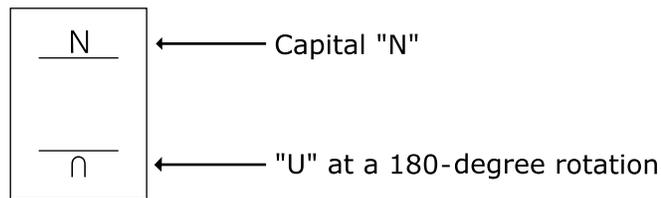
Paper for foldable (3 sheets of different colors of paper for each student)

Stapler

“S” and “O” posters from packet

Index card per student pair with “N” and “U” on both sides

*These will need to be made by the teacher or students. Both sides of the card will be identical. Put a capital “N” at the top of the card. Rotate the card 180 degrees and put a capital “U” at the top. Students will be able to show the “N” for necessary information or flip the card around to show the “U” for unnecessary information.



[ESSENTIAL QUESTIONS]

1. What do the S and O in SOLVE represent?
2. Why is it important to know what the problem is asking?
3. Why is it important to organize the facts in a word problem?

[WORDS FOR WORD WALL]

S – Study the Problem

O – Organize the Facts

[GROUPING]

Cooperative Pairs (CP), Whole Group (WG), Individual (I)

*For Cooperative Pairs (CP) activities, assign the roles of Partner A and Partner B to students. This allows each student to be responsible for designated tasks within the lesson.

[LEVELS OF TEACHER SUPPORT]

Modeling (M), Guided Practice (GP), Independent Practice (IP)

LESSON 1: SOLVE – S and O

[MULTIPLE REPRESENTATIONS]

SOLVE, Verbal Description, Graphic Organizer

[WARM-UP] (5 minutes – IP, I, WG) S1 (Answers on T9.)

- Have students turn to S1 in their books to begin the Warm-Up. Students will practice repeated addition. Monitor students to see if any of them need help during the Warm-Up. Give students 3 minutes to complete the problems and then spend 2 minutes reviewing the answers as a class. **{Verbal Description}**

[HOMEWORK] (5 minutes)

Take time to go over the homework from the previous night.

[LESSON] (60 minutes – M, GP, IP, WG, CP)**Introduce SOLVE****(5 minutes – WG) T10**

Place T10 on the overhead. Explain to students that SOLVE is a method that can be used to help them solve word problems. Point out the five steps of SOLVE on T10 and read them aloud. Tell students that they will be using this problem-solving method throughout the year. Tell students that they will work on the first two steps of SOLVE (S and O) for this lesson. **{Verbal Description, SOLVE, Graphic Organizer}**

Work with SOLVE – S Step**(10 minutes – M, GP, WG, CP, IP)
T11, T13, S2, S3 (Answers on T12, T14.)****4 minutes – M, GP, WG, CP:**

Have students turn to S2 in their books, and place T11 on the overhead. Assign the roles of Partner A and Partner B for designated tasks. Use the following activity to model the S step in SOLVE for students. **{Verbal Description, SOLVE, Graphic Organizer}**

LESSON 1: SOLVE – S and O

MODELING**Work With SOLVE – S Step**

- Step 1:** Begin by reading Problem 1 to your students. Tell students that a good problem solver should be able to understand what the problem is asking them to find. Point to the S step under Problem 1 on T11. Explain that “**S**” stands for **Study the Problem**. Explain to students that in this step they will underline the question and determine what the problem is asking them to find. Have students underline the question in Problem 1 on S2 as you do the same on T11.
- Step 2:** Ask students to work with their partners and, in their own words, say what Problem 1 is asking them to find. Have student pairs share their answers with the whole class. An example of a correct answer for Problem 1 is “This problem is asking me to find the difference in the amount of money Monique has and the money she needs to buy the jeans.”
- Step 3:** Have students fill in the blank for “S” under Problem 1 as you do the same on T11. Students should write what the problem is asking them to find in their own words.

4 minutes – CP, IP:

In partners, have students complete the S step only for Problems 2 and 3 on S2 and S3. Have Partner A complete Problem 2. Have Partner B complete Problem 3. Tell partners to share and discuss their answers. Circulate through the room, monitoring student discussion and work, as well as answering questions. Remind students that they are only looking for what the problem is asking them to find, not working on the O step or solving the problem. {**Verbal Description, SOLVE, Graphic Organizer**}

2 minutes – WG:

Bring the class back together and have student pairs share their answers for Problems 2 and 3. For Problem 2, an example of a correct answer is “This problem is asking me to find the number of minutes Dennis and Eugene ran all together.” Write the answers on T11 and T13 as students share their answers. Remind students that their wording for the S step may differ slightly from other student pairs. {**Verbal Description, SOLVE, Graphic Organizer**}

LESSON 1: SOLVE – S and O

Work with SOLVE – O Step**(20 minutes – M, GP, WG, CP) T11, T13, S2, S3 (Answers on T12, T14.)**

12 minutes – M, GP, WG, CP: Have students turn to S2 in their books, and place T11 on the overhead. Review the S step for Problem 1. Have partners identify what the problem is asking them to find. Tell students that they will now learn the O step in SOLVE. Use the following activity to model the O step in SOLVE for students.
{Verbal Description, SOLVE, Graphic Organizer}

MODELING**Work With SOLVE – O Step**

Step 1: Point to the O step under Problem 1 on T11. Explain that “**O**” stands for **Organize the Facts**. Explain that word problems contain facts that are easier to deal with when organized. Organizing the facts helps good problem solvers pay attention to details. Explain to students that in the O step they will:

- Identify the facts.
- Eliminate the unnecessary facts.
- List the necessary facts.

Talk with students about what a fact is. Explain that a fact is any statement, whether it is needed to solve the problem or not. Facts can be numbers. For example, a fact could be the number of points a team scored in a game or the temperature of something hot or cold. A fact might also explain how much something costs. There may be more than one fact in a sentence. Some facts are necessary when solving a problem, and some are not.

Tell students that in order to determine if a fact is necessary, they should go back to the S step to decide if the fact is needed to determine what the problem is asking them to find.

Step 2: Tell students that you are going to reread Problem 1, and you want them to say “fact” every time they hear a fact. You may need to remind them that a fact is any statement. Tell students that if they have not said “fact” by the time you get to a period, they should say “fact” at the end of the sentence.

Reread Problem 1. Every time students say “fact,” place a vertical line between the two facts.

LESSON 1: SOLVE – S and O

Step 3: Distribute an index card (see T1) to each pair of students or make these cards at this time. Go back and reread each fact in Problem 1 and ask students if the fact is necessary to know in order to find what students are being asked to find in S. Partners should briefly discuss their answers. Have them show “N” on the index card if the fact is necessary or “U” on the index card if the fact is unnecessary.

Have students justify their answers based on what the problem is asking them to find in the S step. For example, the first fact in Problem 1 is “Monique wants to buy some new jeans.” This fact is not necessary because students do not need to know that Monique wants to buy some new jeans in order to determine how much more money she needs to buy the jeans. The second fact in Problem 1 is “She saw them seven days ago at the mall.” This fact is also unnecessary. The next fact is “The jeans cost \$22, including tax.” This fact is necessary because in order to find out how much more Monique needs, students need to know how much the jeans cost. Make sure students consistently reference the S step when determining if a fact is or is not necessary. If a fact is not needed, have students cross it out in the problem as you do the same on T11. If the fact is necessary, have students write it down under O on S2 as you do the same on T11.

LESSON 1: SOLVE – S and O

5 minutes – IP, CP: Have students complete the O step for Problems 2 and 3 on S2 and S3 in partners. Have Partner A complete Problem 2 and Partner B complete Problem 3. Have partners share answers and discuss. Circulate through the room monitoring student discussion and work, as well as answering questions. Remind students that they are only looking at what the problem is asking them to find and organizing the facts, not solving the problem. **{Verbal Description, SOLVE, Graphic Organizer}**

3 minutes – WG : Bring the class back together, and have students share their answers for Problems 2 and 3. Write the correct answers on T11 and T13 as students share their answers. **{Verbal Description, Graphic Organizer, SOLVE}**

SOLVE Foldable**(5 minutes – M, GP, WG)**

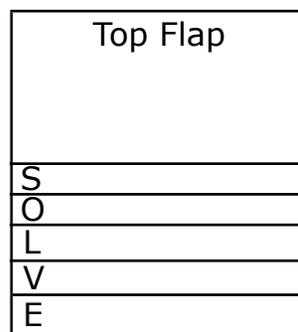
Pass out the paper (three sheets of different colors) to each student. Use the following activity to model for students how to line up the three sheets of paper and fold them to create the SOLVE foldable. **{Verbal Description, Graphic Organizer, SOLVE}**

MODELING**SOLVE Foldable**

Step 1: Place the three sheets on top of each other.

Step 2: Turn so that you are facing the same way as your students. Show them how to move the sheets down, so they see about half of an inch of the top of each color of paper (stair steps).

Step 3: Turn the paper so that the colored edges are away from you. Fold the sheets down toward you, creating six flaps. Then, crease the fold and staple just below the fold line.



LESSON 1: SOLVE – S and O

SOLVE Foldable – Practice Problem**(18 minutes – M, GP, WG, IP)
T13, S3 (Answers on T14.)**

Use the following activity to model how to complete the S and O Steps in the SOLVE foldable. {**Verbal Description, Graphic Organizer, SOLVE**}

MODELING**SOLVE Foldable – Practice Problem**

- Step 1:** On the top (largest) flap, have students copy Problem 4 from S3 and write their name in the bottom right-hand corner. On the bottom left-hand corner of the remaining flaps, have students write the letters of SOLVE, one letter on each flap.
- Step 2:** Ask students what the S in SOLVE stands for (Study the Problem) and have them write that next to the S on the flap. At the top of this page, have students write the two parts of the S step. (Underline the question and “What is this problem asking me to find?”)
- Step 3:** Read Problem 4 with students and have them complete the S step in their foldable as you model on T13. Have students underline the question in the word problem on the top flap and then write on the S flap, “This problem is asking me to find the number of football cards each boy will receive.”

At this time, post the “S” poster in a place in the room where it can be seen by all students. {**SOLVE, Verbal Description, Graphic Organizer**}

- Step 4:** Ask students what step comes next in SOLVE (O – Organize the Facts). Have them write “Organize the Facts” next to the O on the third flap. At the top of this page, have students list the three things they must do in the O step. (identify the facts, eliminate the unnecessary facts, and list the necessary facts)

Together with students, read the problem again and complete the O step. Have students call out “fact” as you read each fact, and then mark them.

Have students mark the facts on the top flap of their foldables as you mark them on T13. Then, model how to strike the unnecessary facts and list the necessary facts on T13 as students list them on the “O” page of their SOLVE foldables.

At this time, post the “O” poster in a place in the room where it can be seen by all students. {**SOLVE, Verbal Description, Graphic Organizer**}

LESSON 1: SOLVE – S and O

The SOLVE foldable will be used for all of the SOLVE lessons (1–3), with students adding information as each of the letters of the method are taught.

If time permits...**(10 minutes – CP, IP) S4 (Answers on T15.)**

Have students work to complete Problems 1–2 on S4 for S and O with a partner.

[CLOSURE] (2 minutes)

To wrap up the lesson, go back to the essential questions and discuss them with students.

- What do the S and O in SOLVE represent? (*S means "Study the Problem," and O means "Organize the Facts".*)
- Why is it important to know what the problem is asking? (*Without a real understanding of what the problem is asking, it may not be solved properly and the answer may be incorrect.*)
- Why is it important to organize the facts in a word problem? (*Facts are easier to deal with when organized. It helps to focus on the facts that are necessary to answer the question being asked.*)

[HOMEWORK] Assign S5–S6 for homework. (Answers on T16–T17.)

[QUIZ ANSWERS] T18–T20

The quiz can be used at any time as extra homework or to see how students progress on learning and practicing the S and O steps in the SOLVE problem-solving method.