# PRACTICE TASK: At the Mechanic

Approximately 1-2 days

## STANDARDS FOR MATHEMATICAL CONTENT

- MCCK.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings[1], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
- MCCK.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- MCCK.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
- MCCK.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
- MCCK.OA.5 Fluently add and subtract within 5

## STANDARDS FOR MATHEMATICAL PRACTICE

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.

## BACKGROUND KNOWLEDGE

In developing the meaning of operations, teachers should ensure that students repeatedly encounter situations in which the same numbers appear in different contexts. For example, the numbers 3, 4, and 7 may appear in problem-solving situations that could be represented by 4 + 3, or 3 + 4, or 7 – 3, or 7 – 4. Although different students may initially use quite different ways of thinking to solve problems, teachers should help students recognize that solving one kind of problem is related to solving another kind. Recognizing the inverse relationship between addition and subtraction can allow students to be flexible in using strategies to solve problems (NCTM Principles and Standards, 2012).

## ESSENTIAL QUESTIONS

- Can patterns be found in numbers?
- Can you describe the patterns you find?

- Are some patterns the same?
- How are the number patterns different?
- How can I prove that groups are equal?
- What is a number relationship? How can number relationships help me?
- What is a pattern and where can you find patterns?
- What is a strategy?
- Why do we use mathematical symbols?
- Why is it important that I can build the number combinations for the number 5? 10?

## MATERIALS

- *At the Mechanic* recording sheet
- *At the Mechanic* playing cards
- Index cards
- Ten-frame
- Red/Yellow counters
- Rekenrek

## GROUPING

Individual, Small group task

## TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

**Part I**
Gather students in a meeting area to discuss cars and what happens to cars when they break down. Where do they go? Who fixes them? One at a time, share the following 3 equations with students:

4 =2+1 3+1 = 1+3 2+3 = 5-1

With each number sentence, ask the students to share their observations. Is the number sentence correct? If not, what is wrong with it? What do we need to do to fix it?

**PART II**
In partners, students place all the cards in a pile, face down. Player 1 takes the top card from the pile and verifies whether the equation is correct and whether both sides are equal.

The player must first mentally state whether the equation is accurate and justify their reasoning. Player 1 verifies their prediction by using a ten frame with red/yellow counters or with the Rekenrek or another manipulative. If the equation is correct, the turn is over and the car doesn't need to be fixed. Player 2 turns over the top card and proceeds to fix the car if it is needed.

If the equation is inaccurate, then player 1 records the equation on the recording sheet and circles the side of the equation that they plan to fix. On the other side of the mechanic shop, player 1 must "fix" the broken car with a pictorial and numeral representation to make it work. ONLY ONE NUMBER CAN BE FIXED ON THE CAR, however, it doesn't matter which one.

After player 1 has justified the answer and recorded it on the task sheet, Player 2 inspects the fixed car to make sure it is correct. If player 2 spots something wrong with the corrected car, they let the mechanic know, but don't tell them what is wrong. Player 1 must attempt to fix the car again. Once the car is fixed, the roles are reversed and Player 2 pulls the top card.

The first mechanic to fix 5 cars wins.

**PART III**
Have the partners sort the cars into 2 piles: cars that are broken and cars that don't need to be fixed. Next, have the students create 3 number sentences that are incorrect and trade them with their partner to fix.

## FORMATIVE ASSESSMENT QUESTIONS

- What side of the car needed fixing? What was wrong with it? How do you plan to fix it?
- When you were inspecting the car, what were you looking for?
- Did you have a strategy for making the car balance?

## DIFFERENTIATION

### Extension

- Create equations with combinations to 10 (Example 8+1 = 9-2) for students to repair. Do not tell students what side of the car to fix, but they must fix the side that has a lower total to match the side that has the greater total of the two sides.

### Intervention

- Create equations where one side of the equation is only one number (Example 4 = 1+2). This will allow the students to focus on the combinations from only one side.
- Allow the students to fix both numbers on one side of the equation, as long as it is not the exact same as the other side.

# At the Mechanic

| Broken Car → → → → → |
| --- |
| 5+1 = 2+6 |
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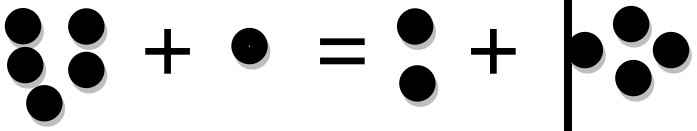
| |
| |

## The Mechanic






| → → → → → Repaired Car |
| --- |
|  |
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|---|---|---|
|  3+2 = 4+0 |  3 = 2+1+1 |  5 = 4-1 |
|  4-2 = 1+3 |  4 = 4+0 |  1 = 4-3 |
|  3+2 = 2+1 |  3+2 = 2-1 |  3-2 = 2+0 |

| | | |
|---|---|---|
|  3-3 = 1+0 |  0+0 = 4-4 |  3+2 = 0+5 |
|  2+1 = 4+0 |  1+2 = 3+2 |  4 = 1+2 |
|  3+2 = 4+0 |  3+2 = 4+0 |  3+2 = 4+0 |