Click-On TEKS

A simple approach to understanding the Texas Essential Knowledge and Skills

GRADE 2 MATH
Structure of the TEKS
The Texas Essential Knowledge and Skills (TEKS) consists of four parts.

Part 1: The Introduction
The state standards, or TEKS, for each grade level begin with an Introduction. The Introduction gives an overview of the focal areas for each grade and provides general information about numerical fluency and the processing skills. While the Introduction has not been reprinted in this product, information from the Introduction has been included in the explanations of the TEKS where appropriate.

Part 2: Strands
The standards are broken into groups or categories called Strands. The TEKS for elementary mathematics are divided into six strands:
1. Mathematical Process Standards: This strand contains the process standards for mathematics which are the same from Kindergarten through Pre-Cal. The process standards are the ways that students acquire math content through the use of models and tools, communication, problem solving, reasoning and analysis, and making connections. These standards should be woven consistently throughout the content strands (2–6). The dual coded questions on STAAR will be coded with a content standard and a process standard.
2. Number and Operations
3. Algebraic Reasoning
4. Geometry and Measurement
5. Data Analysis
6. Personal Financial Literacy

Example

2.1 Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace.

Part 3: Knowledge and Skills Statements
Immediately following the strand is the Knowledge and Skills (K&S) statement. It provides the context for the student expectations that follow it.

Numbering: The first number is the grade level. The second number is the Knowledge and Skills number. The K&S statement shown is from second grade.

Part 4: Student Expectations
Immediately following each Knowledge and Skills statement is a list of Student Expectations (SE).
The letters, such as (A), refer to what students are expected to do with regard to a particular Knowledge and Skills statement. We often refer to this example as 2.1A. [Grade Level second grade, Knowledge and Skills statement (1), Student Expectation (A)]
2.4 Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to:

2.4B add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations.

To show mastery of this standard, students must add and subtract two-digit numbers. They must be able to do the operations using both mental strategies and algorithms. The mental strategies and the algorithms must be based on place value and the properties of operations.

What are mental strategies? Mental strategies are problem attack strategies that are based on a student’s understanding of and flexibility with numbers. They are often faster and more accurate than using regular algorithms. When students begin to add and subtract with mental strategies, their work is often slow and inefficient. However, with continued experience, students become faster and more agile with numbers, and they can often solve problems more quickly than with the traditional algorithm.

Example/Activity

Some examples of mental strategies for addition are:

- Split strategy, which is based on composing and decomposing numbers. For this strategy, students break numbers into logical subsets to find numbers that are easy to add in their heads.
- Jump strategy, which is similar to counting on or counting back, is often used with an open number line. Students jump to benchmark numbers while keeping the amount of the jump in their heads. Students working with a completely open number line have been found to make fewer errors than those working with number lines that already contain benchmarks.
- Shortcut strategy, which is also called compensation, involves finding the nearest 10 and then compensating with the other number.

This is not an exhaustive list, as students may use these strategies differently from what is listed and may come up with their own strategies. As long as the strategies consistently work and are based on place value, and as long as students can justify them, then their invented strategy is fine.

(Van de Walle, et al. 2012)

<table>
<thead>
<tr>
<th>Mental Strategies with 23 + 59</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Split Strategy</strong></td>
</tr>
<tr>
<td>20 and 50 is 70.</td>
</tr>
<tr>
<td>3 and 9 are 12.</td>
</tr>
<tr>
<td>70 + 12 = 82, so 23 + 59 = 82.</td>
</tr>
</tbody>
</table>

Some examples of mental strategies for subtraction are:

- Counting up is a simple way to subtract and is commonly used by adults when doing mental subtraction. To count up, start with the subtrahend and add up. This could also be called think addition.
- Take-away subtraction is the more difficult of the two strategies. Most students will begin by taking away the tens and then the ones. They will compensate when they need to take away more ones than they have.

(Van de Walle, et al. 2012)

This is not an exhaustive list, as students may use these strategies differently from what is listed and may come up with their own strategies. Again, as long as the strategies consistently work and are based on place value, and as long as students can justify them, then their invented strategy is fine.
2.10 Data analysis. The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:

2.10A explain that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category.

2.10B organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more.

Students in Kindergarten through Grade 1 have worked with bar-type graphs and picture graphs. For these types of graphs, there is a one-to-one correspondence between the picture and the data points. They may use labels, but they are not required to do so.

In second grade, the standards switch to actual bar graphs and pictographs. Bar graphs have actual bars, which may correspond to individual data points, but they may also have intervals other than 1. In pictographs, the picture may also stand for more than one data point. For both types of graphs, labels are now required.

Example/Activity

When the sets of data are larger than single digits, it is helpful to begin to group data, rather than to have one picture or one bar per data point. For pictographs, data that have intervals will be denoted with a key that tells how many each picture stands for. In bar graphs, the interval is shown in the scale of the vertical axis. The scale may skip numbers, like the one below shows.

In the pictograph below, each figure stands for two data points. So, 4 children are walking or biking home, 2 children are riding in a car, and 6 children are taking the bus. Students can skip count to find out how many people walked/biked or rode the bus.

This bar graph shows the same data as the pictograph. Notice the scale on the vertical axis. Not every number is labeled on the vertical axis.