



## Ensure Automatization through Practice and Review

### TIC-TAC-TOE REVIEW

This activity creates an environment for students to discuss and practice using mathematics vocabulary and concepts in a more informal setting. The tic-tac-toe game makes certain that the students switch roles and alternate justifying their answers, and it also creates the opportunity to improve their strategy-building skills.

#### STEP 1: PREPARE MATERIALS.

- Prepare tic-tac-toe sheets by writing a problem in each of the nine boxes. These should all relate to the concept or formula being reviewed. Create at least two different sheets in case some pairs finish early. (See example.)
- Place sheet(s) inside a sheet protector and cover each square with a sticky note.
- Gather dry-erase markers – one for every student or pair.

#### STEP 2: REVIEW CONCEPTS AND DIRECTIONS.

- Review the concept that is being covered for this activity.
- Ask students to use their notes or formula sheets during the activity.
- Explain the rules for the game/activity. (See example.)
- Divide students into pairs and give each pair a sheet and a marker.
  - It's often helpful to pair stronger students with weaker ones, so that the stronger student can fine-tune his or her understanding based on the difficulties the weaker student might have, and the weaker one can see the other model the process.

#### STEP 3: PLAY TIC-TAC-TOE.

- Ask students to pick who goes first. The other player chooses to be "X" or "O."
- Player 1 chooses a square, removes the sticky note, and attempts to solve the problem.
- If the answer is correct, Player 1 marks an "X" or "O" on that square.
  - Note that each student should be doing the problem, so that they can check each other's work. If there are any disputes that can't be resolved this way, students can use the teacher as a resource.
- If it's incorrect, Player 1 replaces the sticky note and Player 2 begins.
- The first player to complete a row of three "X"s or "O"s wins!
  - However, the side goal is for students to discover that there are strategies in which there is no "winner" for tic-tac-toe. This will help keep the stronger students motivated throughout the activity.

#### STEP 4: EXTRA PRACTICE.



- If one pair finishes early, have them replace the sticky notes, remove the top sheet, and start the game over with a new grid of nine practice problems.

**STEP 5: DISCUSS STRATEGIES AND CONCEPTS.**

- Ask students to share their experiences with this activity and what strategies they used to win. (You can also eliminate the sticky notes and see if their strategies change based on the level of the problems.)
- Review the steps and main ideas for the concept being covered to reinforce students' understanding and clarify any confusion.

**EXAMPLE SHEET for TIC-TAC-TOE:**

This sheet includes problems related to geometric formulas, but the activity could be used for any topic, such as adding fractions, solving equations, finding roots of a polynomial, etc.

 <p>Find the area.</p>	<p>Find the perimeter of a square with sides of length 2.3 m.</p>	<p>Find the volume of a sphere with radius 2 ft.</p>
<p>Find the surface area of a cube with side length <math>\frac{3}{4}</math> of an inch.</p>	 <p>Find the perimeter.</p>	<p>Find the circumference of a circle with diameter 3 m.</p>
<p>Find the area of a triangle with base 7 ft and height 3 ft.</p>	<p>Find the perimeter of a triangle with sides of length 2, 5, and 6 inches.</p>	<p>Find the area of a rectangle with sides equal to 3.5 and 7.9 m.</p>

**HOW DOES THIS ENSURE AUTOMATIZATION?**

- Students are given a chance to review concepts and practice using their knowledge in a different setting.
- If the class has moved on to another topic, this activity is a great way to spiral back and review previously covered skills.
- Repeated practice and discussion with this activity will also mean that students' strategies for problem-solving and not allowing the other to win will be enhanced.