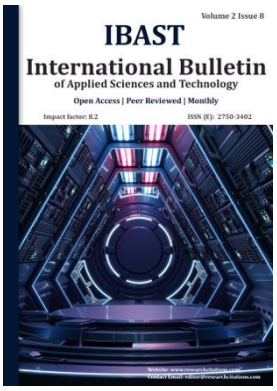

APPLYING THE TARSIA METHOD AS ACTIVE LEARNING IN PRESIDENTIAL SCHOOLS

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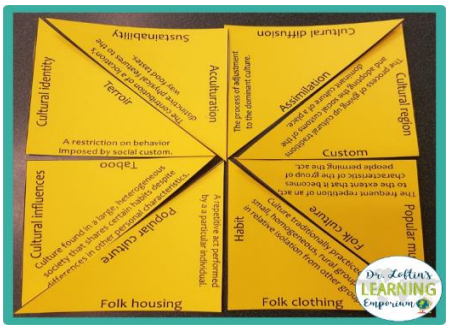
Abstract: Puzzles are a pretty common sight in elementary classrooms, but you don't typically see them much in secondary classrooms. I think that's crazy! Puzzles have so many benefits, and they can even help strengthen and create new connections in our brains. That's why I love using Tarsia puzzles to teach vocabulary! Keep reading to learn about the benefits of using puzzles in your classroom, what exactly a Tarsia puzzle is, and how you can even create your own with a set of blank Tarsia puzzle templates! This research aims to determine whether Tarsia puzzle can be used to create joyful learning of mathematics according to elementary school teachers' perception. Forty two elementary school teachers who teach at different schools in Presidential schools. Students often find difficulties in solving mathematical problems. PISA 2018 results show that Indonesia ranked 75th out of 80 countries. Mathematical average score for Indonesia is 379. This score is still far from the global mathematical average score of 489 (OECD, 2019). Simamora et al., (2018) found that the level of students' mathematics skills was still low and students were less interested in mathematics because they faced some difficulties to understand that subject. Teachers should give a strong mathematical foundation to students from an early age.

Keywords: Tarsia puzzle, Mathematical average, PISA, Modern education, Active learning methods, Innovative approaches, Prospects of application.

A Tarsia puzzle is very similar to a jigsaw, but the pieces are usually geometric shapes such as triangles, squares, or hexagons. The sides of every puzzle piece feature a piece of content that matches with another piece. The geometric shapes come together to create a larger geometric shape. It's a little hard to explain, so it's better to just show you.



In this puzzle, students match vocabulary words to definitions. You'll notice that some of the edges have vocabulary terms that don't match with anything. These are

just distractors to make the puzzle a little more challenging! The Tarsia method, a form of active learning, can be effectively applied in Presidential Schools to enhance student engagement and understanding. This method utilizes puzzles created with specialized software, where students match clues or statements to form specific shapes, promoting active participation and critical thinking.

Steps to Implement the Tarsia Method

1. Identify Learning Objectives:

• Determine the key concepts or skills that need to be addressed. This could be related to subjects like mathematics, science, history, or language arts.

2. Create Puzzle Content:

• Develop a set of questions and answers or concepts and definitions that align with the learning objectives.

• Ensure that the content is challenging but accessible, promoting critical thinking.

3. Design the Puzzle:

• Use a Tarsia puzzle generator (available online) to create the puzzle layout. The generator will help arrange the pieces so that they fit together logically.

• Alternatively, create a physical version using cardboard or paper.

4. Group Students:

• Divide students into small groups, ensuring a mix of abilities and backgrounds to foster collaboration.

• Assign roles within each group (e.g., facilitator, note-taker, presenter) to encourage participation.

5. Introduce the Activity:

• Explain the rules of the Tarsia activity and how it connects to the learning objectives.

• Provide students with the puzzle pieces and give them time to work collaboratively to match questions with answers.

6. Facilitate Discussion:

• As students work on the puzzle, circulate around the classroom to provide support and facilitate discussions.

• Encourage students to explain their reasoning and engage in dialogue about the concepts.

7. Review and Reflect:

• Once the puzzle is completed, hold a class discussion to review the answers and clarify any misunderstandings.

• Ask students to reflect on what they learned from the activity and how collaboration helped their understanding.

8. Assess Learning Outcomes:

• Use formative assessments (e.g., quizzes, written reflections) to evaluate student understanding of the material.

• Consider having students create their own Tarsia puzzles as a way to reinforce their learning.

Benefits of the Tarsia Method

• Promotes Collaboration: Students learn to work together, share ideas, and build on each other's knowledge.

• Enhances Engagement: The interactive nature of puzzles keeps students motivated and focused on learning.

• Develops Critical Thinking: Students must analyze, synthesize, and evaluate information to complete the puzzle.

• Supports Differentiation: The method can be adapted for various skill levels, allowing all students to participate meaningfully

Example of Tarsia Math Puzzle

Tarsia Math Puzzle: ADDING WITHIN 10

In this activity, students will practice *adding 2 single-digit numbers*, as they piece together the pieces of each tarsia puzzle (5 DIFFERENT PUZZLES INCLUDED). Students will match their answers with a separate puzzle piece until all the math problems have been solved and the puzzle is completed.

These MATH TARSIA PUZZLES are a FUN way for students to practice their multiplication facts that doesn't involve a worksheet. The puzzle activity works well for individuals, as well as small groups. Alternatively, you can set up stations around the room, and have students or groups rotate to each station for a new math puzzle/game.

This resource includes:

5 Differentiated tarsia puzzles with a different puzzle shape for each

5 Answer keys

Teacher directions

Suggestions for using this resource:

Print multiple copies of each tarsia puzzle and place the pieces in separate plastic bags for safekeeping.

Print the puzzles on colored paper if you find the black and white version too "dull".

Print the puzzles on A3 sized paper if you want the pieces extra large.

Laminate the puzzle pieces BEFORE your students cut them out. It will allow you to use them for years to come.

Code the backside of each puzzle piece, so it is easier to find which plastic bag they belong to in case they get mixed up with other pieces.

Check out our other Math Tarsia Puzzles!

Math Tarsia Puzzle: MULTIPLICATION FACTS 2 to 5

Math Tarsia Puzzle: MULTIPLICATION FACTS 6 to 9

Math Tarsia Puzzle: MULTIPLICATION FACTS 5 and 10

Math Tarsia Puzzle: ADDING 2-DIGIT NUMBERS (NO REGROUPING)

Math Tarsia Puzzle: ADDING WITHIN 10

Summary: Implementing the Tarsia Method in Presidential Schools can transform traditional learning into an engaging and collaborative experience. By emphasizing active participation and critical thinking, this approach aligns well with the goals of fostering high academic achievement and developing essential life skills in students.

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