21st-Century Pedagogy

Ministry of Education
Royal Government of Bhutan
21st-Century Pedagogy

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1. The History of Education

How are modern education systems different from education systems in the past?
HISTORY OF BOOKS

- Books were all **HANDWRITTEN**.
- Paper was **very difficult** to make.
- Books were extremely **rare** and **expensive**.
- As a result, **most people did not learn how to read**.
  - How can we learn to read if there is nothing to read?
Historically, most people who knew how to read and write were part of religious institutions.
The printing press changed everything!
Mass literacy would be impossible without the printing press.
In a world of books, **rote learning** (memorization) is a useful approach to education.

- **Why?**

Rote learning was the normal approach to education in most of the world, **BUT SOMETHING HAS CHANGED!**

**What?**
2. Technological Change and Education

How has technological change impacted the education systems of the world?
The printing press changed everything!
The Internet
Is changing everything!
Technological Change

- Printing Press
- INTERNET

Style of Pedagogy

- Rote Learning
THE BIG CHALLENGE

- Students don’t need to memorize every fact, **BUT** they do need to understand how to thrive in a world that is changing **SOCIALLY** and **TECHNOLOGICALLY**.
THE BIG CHALLENGE

● Students don’t need to memorize every fact, **BUT** they do need to understand how to thrive in a world that is changing **SOCIALY** and **TECHNOLOGICALLY**.

○ How do we prepare students for a world that is always changing?
How do we prepare students for a world that is always changing?

- **Literacy** and **mathematics** are still the foundation of education.
How do we prepare students for a world that is always changing?

- **Literacy** and **mathematics** are the still the foundation of education.

- However, instead of having students memorize information, we must teach **creative problem-solving**.
What is creative problem-solving?

- Creative problem-solving is a type of critical thinking in which we use our knowledge and resources to solve new problems.
Why teach **creative problem-solving**?

- **Creative problem-solving** skills prepare students for the **changing** world.
Why teach creative problem-solving?

- Creative problem-solving skills prepare students for the changing world.
- Creative problem-solving activities can strengthen students’ verbal reasoning and mathematical reasoning skills.
Why teach **creative problem-solving**?

- **Creative problem-solving** skills prepare students for the **changing world**.
- Creative problem-solving activities can strengthen students’ **verbal reasoning** and **mathematical reasoning** skills.
- **Verbal reasoning** and **mathematical reasoning** are the foundations of ‘modern’ skills such as **computer programming**.
Why teach creative problem-solving?

- Creative problem-solving skills prepare students for the changing world.
- Creative problem-solving activities can strengthen students’ verbal reasoning and mathematical reasoning skills.
- Verbal reasoning and mathematical reasoning are the foundations of ‘modern’ skills such as computer programming.
- Even if students don’t have expensive technology in the classroom, strong creative problem-solving abilities enable students to learn new skills and technologies more quickly.
Creative Problem-Solving in the Classroom

- Verbal Reasoning
- Mathematical Reasoning

Modern Skills

- Computer Science
- Data Analysis
- Artificial Intelligence Engineering
- Natural Language Processing
Demonstration of ‘Modern’ Skills:

- 1. Geodata App
- 2. Artificial Intelligence Engineering
- 3. Natural Language Processing
Takeaways from Demonstrations:

- Memorization is not necessary for creative problem-solving.
- Mathematical reasoning AND verbal reasoning are the foundations of ‘modern’ skills.
- We need young Bhutanese to be prepared to learn these ‘modern’ skills.
Want to learn how to code?:

- Khan Academy
  - https://www.khanacademy.org/computing/computer-programming
- Code Academy
  - https://www.codecademy.com/
- What is the best coding language to start with?
  - Python
3. The Pedagogy of Creative Problem-Solving

How might teachers design classroom activities to improve students’ *creative problem-solving* abilities?
How might teachers design classroom activities to improve students’ creative problem-solving abilities?

- Problems with more than one solution
● How might teachers design classroom activities to improve students’ creative problem-solving abilities?

■ Problems with **more than one solution**

■ Problems that require both **knowledge** and **resources**
How might teachers design classroom activities to improve students’ creative problem-solving abilities?

- Problems with **more than one solution**
- Problems that require both **knowledge** and **resources**
- Problems that require **collaboration**
● How might teachers design classroom activities to improve students’ creative problem-solving abilities?

■ Problems with more than one solution
■ Problems that require both knowledge and resources
■ Problems that require collaboration

● How do we know that such activities are good for learning?
The effect of problem structure on problem-solving: An fMRI study of word versus number problems
Sharlene D. Newman, Gregory Willoughby, Benjamin Pruce
Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN 47405, USA
Neural Correlates of Creative Writing: An fMRI Study
Carolin Shah, Katharina Erhard, Hanns-Josef Ortheil, Evangelia Kaza, Christof Kessler, and Martin Lotze
Functional Imaging Unit, Institute for Diagnostic Radiology and Neuroradiology, University of Greifswald, Germany
THE CREATIVE PROBLEM-SOLVING WORKOUT!
Creative Problem-Solving in the Classroom

- Verbal Reasoning
- Mathematical Reasoning

Modern Skills

- Computer Science
- Data Analysis
- Artificial Intelligence Engineering
- Natural Language Processing
Creative Problem-Solving in the Classroom

Modern Skills

- Computer Science
- Data Analysis
- Artificial Intelligence Engineering
- Natural Language Processing

Computers Required!
Creative Problem-Solving in the Classroom

- Verbal Reasoning
- Mathematical Reasoning

No computers! No problem!

Modern Skills

- Computer Science
- Data Analysis
- Artificial Intelligence Engineering
- Natural Language Processing

Computers Required!
4. Creative Problem-Solving in the Classroom

- Scattergories
- Mathetron
- Scrabble
- Grammar Scrabble
EXAMPLE 1: Scattergories

**Goal:** Improve students’ knowledge of English spelling and vocabulary (this game could be adapted for Dzongkha too!)

**Student Profiles:** class 4 and above

**Required Tools:** blackboard, chalk, pens, paper, (dictionaries if available)

**Time Required:** 10-15 minutes (per round)
EXAMPLE 1: Scattergories

**STEP 1:** Divide classroom into teams (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.
EXAMPLE 1: Scattergories

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STEP 2: Choose up 8-10 categories and write them on the board.
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STEP 1: Divide classroom into teams (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

STEP 2: Choose up 8-10 categories and write them on the board.

- **Item categories**: animals, fruits/vegetables, countries, national capitals, gewogs, etc.

STEP 3: Choose a random letter (except for J, K, Q, X, Y, Z) and write it on the board.

STEP 4: Allow students 5 to 10 minutes to write their list of words.
EXAMPLE 1: Scattergories

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- **Item categories**: animals, fruits/vegetables, countries, national capitals, gewogs, etc.
- **Grammar categories**: verb, adjective, abstract noun, etc.
- **Suffix categories**: -able, -an, -ance, -al, -ally, -ate, -ation, -er, -est, -ent, -ful, -ic, -ies, -ied, -less, -ize, -ly, -ment, -ness, -tion, -ology, -ous, etc.
## Scattergories

<table>
<thead>
<tr>
<th>Categories</th>
<th>Team 1</th>
<th>Team 2</th>
<th>Team 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
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<tr>
<td>Fruit/Vegetable</td>
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</tbody>
</table>

**Our letter is:** Scattergories
EXAMPLE 1: Scattergories

STEP 1: Divide classroom into **teams** (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

STEP 2: Choose up 8-10 **categories** and write them on the board.

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- **Suffix categories**: -able, -an, -ance, -al, -ally, -ate, -ation, -er, -est, -ent, -ful, -ic, -ies, -ied, -less, -ize, -ly, -ment, -ness, -tion, -ology, -ous, etc.

STEP 3: Choose a **random letter** (except for J, K, Q, X, Y, Z) and write it on the board.
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</tr>
</tbody>
</table>

Our letter is:
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</tr>
</thead>
<tbody>
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<tr>
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<td>Animal</td>
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</tbody>
</table>

Our letter is: B
EXAMPLE 1: Scattergories

STEP 1: Divide classroom into **teams** (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

STEP 2: Choose up 8-10 **categories** and write them on the board.

- **Item categories**: animals, fruits/vegetables, countries, national capitals, gewogs, etc.
- **Grammar categories**: verb, adjective, abstract noun, etc.
- **Suffix categories**: -able, -an, -ance, -al, -ally, -ate, -ation, -er, -est, -ent, -ful, -ic, -ies, -ied, -less, -ize, -ly, -ment, -ness, -tion, -ology, -ous, etc.

STEP 3: Choose a **random letter** (except for J, K, Q, X, Y, Z) and write it on the board.

STEP 4: Allow students 5 to 10 minutes to **write** their list of words.
<table>
<thead>
<tr>
<th>Categories</th>
<th>Team 1</th>
<th>Team 2</th>
<th>Team 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
<td>Bhutan</td>
<td>Bolivia</td>
<td>Bolivia</td>
</tr>
<tr>
<td><strong>Fruit/Vegetable</strong></td>
<td>Banana</td>
<td>Beet</td>
<td>Blueberry</td>
</tr>
<tr>
<td><strong>Animal</strong></td>
<td>Bear</td>
<td>Boa</td>
<td>Buffalo</td>
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<td>Benediction</td>
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<tr>
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<td>Beautifully</td>
<td>Beautifully</td>
<td>Brutally</td>
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<tr>
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<td>Bulbous</td>
<td>Beauteous</td>
<td>Boisterous</td>
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<tr>
<td>-ful</td>
<td>Beautiful</td>
<td>Bountiful</td>
<td>-</td>
</tr>
<tr>
<td>-less</td>
<td>Boundless</td>
<td>Breathless</td>
<td>Borfless</td>
</tr>
</tbody>
</table>

Our letter is: B

Scattergories
Scattergories Scoring Rules

- Teams **may not have the same words** as other teams. Each team must have a unique word.

- Teams receive **1 point** for each word that they correctly categorize as long as other teams didn’t use the same word.
<table>
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<th>Team 2</th>
<th>Team 3</th>
</tr>
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<td>-ly</td>
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<td>Boisterous</td>
</tr>
<tr>
<td>-ful</td>
<td>Beautiful</td>
<td>Bountiful</td>
<td>-</td>
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<tr>
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<td>Boundless</td>
<td>Breathless</td>
<td>Borfless</td>
</tr>
</tbody>
</table>

Our letter is: B
## Scattergories

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</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
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<td>Bountiful</td>
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<tr>
<td><strong>-less</strong></td>
<td>Boundless</td>
<td>Breathless</td>
<td>Borfless</td>
</tr>
</tbody>
</table>

Our letter is: **B**
Let's Play!
<table>
<thead>
<tr>
<th>Scattergories</th>
<th>Team 1 7 points</th>
<th>Team 2 5 points</th>
<th>Team 3 8 points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Categories</strong></td>
<td>Team 1 7 points</td>
<td>Team 2 5 points</td>
<td>Team 3 8 points</td>
</tr>
<tr>
<td>National Capital</td>
<td>Canberra</td>
<td>Canberra</td>
<td>Cairo</td>
</tr>
<tr>
<td>Fruit/Vegetable</td>
<td>Cucumber</td>
<td>Carrots</td>
<td>Cranberry</td>
</tr>
<tr>
<td>Animal</td>
<td>Cat</td>
<td>Cougar</td>
<td>Camel</td>
</tr>
<tr>
<td>-ment</td>
<td>Catchment</td>
<td>Compliment</td>
<td>Contentment</td>
</tr>
<tr>
<td>-ness</td>
<td>Carelessness</td>
<td>-</td>
<td>Calmness</td>
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<tr>
<td>-ize</td>
<td>Categorize</td>
<td>Colonize</td>
<td>Characterize</td>
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<tr>
<td>-ly</td>
<td>Carefully</td>
<td>-</td>
<td>Clearly</td>
</tr>
<tr>
<td>-able</td>
<td>Capable</td>
<td>Comfortable</td>
<td>Commendable</td>
</tr>
</tbody>
</table>

Our letter is: __C__
Why is **Scattergories** a good example of creative problem-solving in the classroom?

- Students use **knowledge** and **resources** to solve a problem for which there are **many possible solutions**.

- This game improves **spelling** and **vocabulary**, and the emphasis on **collaboration** ensures that students **learn from each other** in a **supportive classroom** environment.
4. Creative Problem-Solving in the Classroom

- Scattergories
- **Mathetron**
- Scrabble
- Grammar Scrabble
EXAMPLE 2: Mathetron

**Goal:** Improve students’ knowledge of *mathematical reasoning*

**Student Profiles:** Class 4 and above

**Required Tools:** blackboard, chalk, pens, paper, (calculator if available)

**Time Required:** 10-15 minutes per round
EXAMPLE 2: Mathetron

**STEP 1:** Divide classroom into teams (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

**STEP 2:** Choose up 3-8 numbers and 3-8 operators.

Numbers:
0 1 2 3 4 5 6 7 8 9

Operators:
Addition (+), Subtraction (-), Multiplication (x), Division (/), Exponent (^), Factorial (!)

**STEP 3:** Choose a random number between 1 and 100 (or 1 and 1000 for more advanced students).

**STEP 4:** Students have 5 to 10 minutes to make an equation that satisfies the equation. Students can also choose IMPOSSIBLE as their answer.
EXAMPLE 2: Mathetron

**STEP 1**: Divide classroom into **teams** (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

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**Numbers:** 0 1 2 3 4 5 6 7 8 9

**Operators:** Addition (+), Subtraction (-), Multiplication (x), Division (/), Exponent (^), Factorial (!)
<table>
<thead>
<tr>
<th>Operator</th>
<th>Expression</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADDITION</strong></td>
<td>6 + 3</td>
<td>9</td>
</tr>
<tr>
<td><strong>SUBTRACTION</strong></td>
<td>6 - 3</td>
<td>3</td>
</tr>
<tr>
<td><strong>MULTIPLICATION</strong></td>
<td>6 x 3</td>
<td>18</td>
</tr>
<tr>
<td><strong>DIVISION</strong></td>
<td>6 / 3</td>
<td>2</td>
</tr>
<tr>
<td><strong>EXPONENT</strong></td>
<td>6^3</td>
<td>216</td>
</tr>
<tr>
<td><strong>FACTORIAL</strong></td>
<td>6!</td>
<td>720</td>
</tr>
<tr>
<td>Team 1</td>
<td>Numbers:</td>
<td>Operations:</td>
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</tr>
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<td>Team 2</td>
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<td>Team 3</td>
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<td>Team 2</td>
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<tr>
<td>Team 3</td>
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</tbody>
</table>

Numbers:
2 3 5 6 9 1
9 0

Operations:
-  +  x  x
!  /  ^
EXAMPLE 2: Mathetron

**STEP 1:** Divide classroom into **teams** (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

**STEP 2:** Choose up 3-8 **numbers** and 3-8 **operators**.

Numbers: 0 1 2 3 4 5 6 7 8 9

Operators: Addition (+), Subtraction (-), Multiplication (x), Division (/), Exponent (^), Factorial (!)

**STEP 3:** Choose a **random number** between 1 and 100 (or 1 and 1000 for more advanced students.)
<table>
<thead>
<tr>
<th>Team 1</th>
<th>Numbers: 2 3 5 6 9 1 9 0</th>
<th>Operations: - + \times \times ! / ^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team 2</td>
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Numbers: 2 3 5 6 9 1 9 0

Operations: - + × × ！ / ^

=57
EXAMPLE 2: Mathetron

**STEP 1**: Divide classroom into teams (maximum of 5). Each team sits together and chooses one student to write the team’s answers on a piece of paper.

**STEP 2**: Choose up 3-8 numbers and 3-8 operators.

Numbers: 0 1 2 3 4 5 6 7 8 9

Operators: Addition (+), Subtraction (-), Multiplication (x), Division (/), Exponent (^), Factorial (!)

**STEP 3**: Choose a random number between 1 and 100 (or 1 and 1000 for more advanced students.)

**STEP 4**: Students have 5 to 10 minutes to make an equation. Students can also choose IMPOSSIBLE as their answer.
<table>
<thead>
<tr>
<th>Team 1</th>
<th>(6 × 9) + 3</th>
<th>=57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team 2</td>
<td>5! - (9 × (6+1))</td>
<td></td>
</tr>
<tr>
<td>Team 3</td>
<td>(5 × 6) + (3 ^ (2+1))</td>
<td></td>
</tr>
</tbody>
</table>
Mathetron Scoring Rules

- Teams receive 0 points for an incorrect answer.
- Teams receive 1 point for a correct answer that other teams also have.
- Teams receive 2 points a **UNIQUE** correct answer.
# Mathetron!

## Numbers:

- 2
- 3
- 5
- 6
- 9
- 1
- 9
- 0

## Operations:

- `-`
- `+`
- `*`
- `*`
- `!`
- `/`
- `^`

## Team 1

\[ (6 \times 9) + 3 \]

\[ = 54 + 3 \]

\[ = 57 \]

## Team 2

\[ 5! - (9 \times (6+1)) \]

\[ = 120 - (9 \times 7) \]

\[ = 120 - 63 \]

\[ = 57 \]

## Team 3

\[ (5 \times 6) + (3 \times (2+1)) \]

\[ = 30 + (3 \times 3) \]

\[ = 30 + 27 \]

\[ = 57 \]
<table>
<thead>
<tr>
<th>Team 1</th>
<th>((6 \times 9) + 3)</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(= 54 + 3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(= 57)</td>
<td></td>
</tr>
<tr>
<td>Team 2</td>
<td>((6 \times 9) + 3)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(= 54 + 3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(= 57)</td>
<td></td>
</tr>
<tr>
<td>Team 3</td>
<td>((5 \times 6) + (3^{(2+1)}))</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(= 30 + (3^3))</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(= 30 + 27)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(= 57)</td>
<td></td>
</tr>
<tr>
<td>Team</td>
<td>Expression</td>
<td>Result</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Team 1</td>
<td>$(6 \times 9) + 3$</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>$= 54 + 3$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 57$</td>
<td></td>
</tr>
<tr>
<td>Team 2</td>
<td>IMPOSSIBLE!</td>
<td>0</td>
</tr>
<tr>
<td>Team 3</td>
<td>$(5 \times 6) + (3^{(2+1)})$</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>$= 30 + (3^3)$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 30 + 27$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 57$</td>
<td></td>
</tr>
</tbody>
</table>
LET'S PLAY!
<table>
<thead>
<tr>
<th>Team 1</th>
<th>5! - (6×3) - 1</th>
<th>= 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team 2</td>
<td>((5^3)-7)+6</td>
<td></td>
</tr>
<tr>
<td>Team 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why is Mathetron a good example of creative problem-solving in the classroom?

- Students use **knowledge** and **resources** to solve a problem for which there are **many possible solutions**.

- This game improves **mathematical reasoning**, and the emphasis on **collaboration** ensures that students **learn from each other** in a **supportive classroom** environment.
4. Creative Problem-Solving in the Classroom

- Scattergories
- Mathetron
- Scrabble
- Grammar Scrabble
EXAMPLE 3: Scrabble

Goal: Improve students’ knowledge of English spelling and vocabulary

Student Profiles: class 4 and above

Required Tools: blackboard, chalk, SCRABBLE TILES*

Time Required: 30-40 minutes per round
1. You can make your own scrabble tiles with **chart paper**.

2. Remember to use the proper letter ratios.

3. For every 5 students, you need approximately 100 tiles.
EXAMPLE 3: Classroom Scrabble

**STEP 1:** Divide classroom into **teams** (maximum of 5). Each team sits together and with an empty workspace on the desk.
EXAMPLE 3: Classroom Scrabble

**STEP 1:** Divide classroom into **teams** (maximum of 5). Each team sits together and with an empty workspace on the desk.

**STEP 2:** Give each team 40 **scrabble tiles** at the beginning. Give 10 more letters every five minutes.
EXAMPLE 3: Classroom Scrabble

**STEP 1:** Divide classroom into **teams** (maximum of 5). Each team sits together and with an empty workspace on the desk.

**STEP 2:** Give each team 40 **scrabble tiles** at the beginning. Give 10 more letters every five minutes.

OPTIONAL: Make **special rules** for students to receive extra points.

(example: -ght verbs, adjectives, -ly adverbs, etc.)
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**STEP 1:** Divide classroom into **teams** (maximum of 5). Each team sits together and with an empty workspace on the desk.

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OPTIONAL: Make **special rules** for students to receive extra points.

(example: -ght verbs, adjectives, -ly adverbs, etc.)

**STEP 3:** Students have 30 minutes to **make as many words as possible**.
How to play scrabble!

1. Make words that go TOP-DOWN or LEFT-RIGHT
2. All connected tiles must make a word.
3. No proper nouns (names of people and places)
How to play scrabble!

1. Make words that go TOP-DOWN or LEFT-RIGHT
2. All connected tiles must make a word.
3. No proper nouns (names of people and places)
Will the next world Scrabble champion be from Bhutan?
Why is **SCRABBLE** a good example of creative problem-solving in the classroom?

- Students use **knowledge** and **resources** to solve a problem for which there are **many possible solutions**.

- This game improves **spelling and vocabulary**, and the emphasis on **collaboration** ensures that students **learn from each other** in a **supportive classroom** environment.
4. Creative Problem-Solving in the Classroom

- Scattergories
- Mathetron
- Scrabble
- Grammar Scrabble
EXAMPLE 4: GRAMMAR Scrabble

**Goal**: Improve students’ knowledge of English **GRAMMAR**

**Student Profiles**: class 4 and above

**Required Tools**: blackboard, chalk, **GRAMMAR SCRABBLE TILES**

**Time Required**: 30-40 minutes per round
EXAMPLE 4: GRAMMAR Scrabble

**STEP 1:** Divide classroom into teams (maximum of 5). Each team sits together and with an empty workspace on the desk.

**STEP 2:** Give each team 40 GRAMMAR scrabble tiles at the beginning. Give 10 more letters every five minutes.

**OPTIONAL:** Make special rules for students to receive extra points. (example: -ght verbs, adjectives, -ly adverbs, etc.)

**STEP 3:** Students have 30 minutes to make as many SENTENCES as possible.
<table>
<thead>
<tr>
<th>Pronouns</th>
<th>I</th>
<th>YOU</th>
<th>WE</th>
<th>THEY</th>
<th>HE</th>
<th>SHE</th>
<th>IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modal Verbs</td>
<td>CAN</td>
<td>WILL</td>
<td>COULD</td>
<td>WOULD</td>
<td>MIGHT</td>
<td>MAY</td>
<td>MUST</td>
</tr>
<tr>
<td>Auxiliary Verbs</td>
<td>AM</td>
<td>IS</td>
<td>ARE</td>
<td>WAS</td>
<td>WERE</td>
<td>BEEN</td>
<td>BEING</td>
</tr>
<tr>
<td></td>
<td>DO</td>
<td>DOES</td>
<td>DID</td>
<td>HAVE</td>
<td>HAS</td>
<td>HAD</td>
<td></td>
</tr>
<tr>
<td>Verb Forms</td>
<td>V1</td>
<td>V2</td>
<td>V3</td>
<td>V4</td>
<td>V5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER</td>
<td><em>BLANK</em></td>
<td>TODAY</td>
<td>TOMORROW</td>
<td>YESTERDAY</td>
<td>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pronouns</td>
<td>I</td>
<td>YOU</td>
<td>WE</td>
<td>THEY</td>
<td>HE</td>
<td>SHE</td>
<td>IT</td>
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<td></td>
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<td>HAVE</td>
<td>HAS</td>
<td>HAD</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
</tr>
</thead>
<tbody>
<tr>
<td>eat</td>
<td>eats</td>
<td>eating</td>
<td>ate</td>
<td>eaten</td>
</tr>
<tr>
<td>swim</td>
<td>swims</td>
<td>swimming</td>
<td>swam</td>
<td>swum</td>
</tr>
<tr>
<td>play</td>
<td>plays</td>
<td>playing</td>
<td>played</td>
<td>played</td>
</tr>
</tbody>
</table>
How to play scrabble!

1. Make words that go TOP-DOWN or LEFT-RIGHT
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3. No proper nouns (names of people and places)
How to play GRAMMAR scrabble!

1. Make sentences that go TOP-DOWN or LEFT-RIGHT
2. All connected tiles must make a sentence.

I am V3 today

is V3

* V5

could he have been V5

she had

* V4 V5

* you

we are you

is

*
How to play GRAMMAR scrabble!

1. Make sentences that go TOP-DOWN or LEFT-RIGHT
2. All connected tiles must make a sentence.
How to play GRAMMAR scrabble!

1. Make sentences that go TOP-DOWN or LEFT-RIGHT
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How to play **GRAMMAR** scrabble!

1. Make sentences that go TOP-DOWN or LEFT-RIGHT
2. All connected tiles must make a sentence.

```
I am V3 today

is

* * *

V4 V5

have been

she

had

V5

they

* * *

* * *

you

is

are you

* *

is

have

* *

could he

* *

* *

* * *
```

I am today is

you is

she

have

* *

could

* *

had

* *

* *

* *

* * *

* * *

she

* *

the

* *

* * *
How to play **GRAMMAR** scrabble!

1. Make sentences that go **TOP-DOWN** or **LEFT-RIGHT**
2. All connected tiles must make a sentence.
Why is **GRAMMAR SCRABBLE** a good example of creative problem-solving in the classroom?

- Students use **knowledge** and **resources** to solve a problem for which there are **many possible solutions**.

- This game improves **understanding of grammar**, and the emphasis on **collaboration** ensures that students **learn from each other** in a **supportive classroom** environment.
Conclusion and Takeaways

1. The world is changing and school systems that emphasize creative problem-solving will better prepare students for the changing world.

2. In order to improve students literacy and mathematical reasoning skills, we must make opportunities for creative problem-solving in the classroom. Creative-problem solving activities are a great complement to traditional classroom activities, not a replacement.

3. Creative problem-solving in the classroom involves multi-solution problems, creative use of knowledge and resources, collaboration.

4. Scattergories, Mathetron, and Scrabble are good examples of activities, but experiment and make your own classroom activities!

5. Teaching is a difficult job, but when we educate our students to create opportunities for our students.
TASHI DELEK!