

Register at <https://gtenmaths.org/gmsl> Join Thousands Around the World
 Play PELMATHISM to reinforce understanding of fractions, decimals and percentages.

Fractions and Images FI

| | | | | | | |
|---|---------------|----------------|---------------|---------------|---------------|----------------|
| 6 | | $\frac{5}{12}$ | $\frac{5}{8}$ | $\frac{1}{2}$ | | |
| 5 | | | $\frac{5}{3}$ | | | $\frac{1}{3}$ |
| 4 | $\frac{3}{4}$ | $\frac{2}{9}$ | $\frac{5}{4}$ | | $\frac{3}{8}$ | |
| 3 | | $\frac{2}{3}$ | | $\frac{7}{8}$ | | |
| 2 | $\frac{4}{5}$ | | $\frac{1}{6}$ | | $\frac{1}{4}$ | |
| 1 | $\frac{6}{5}$ | $\frac{1}{10}$ | | $\frac{3}{2}$ | | $\frac{3}{10}$ |
| | A | B | C | D | E | F |

SUGGESTIONS FOR TEACHING

Choose a set of cards suitable for your class. Play as a whole class or in small groups. There are versions of the Pelmathism Memory Game for all ages: simple number work for the youngest learners and games to deepen learners' understanding of fractions for upper primary and secondary. These games help to change learners' attitudes to mathematics, providing enjoyable drill and practice and helping learners to become confident, proficient and familiar with fractions and the different representations of the same rational number expressed as a fraction, a decimal, a percentage or in a diagram.

If the cards are arranged on rows and columns, map style references can be used to refer to them. For example, in the Fractions and Images game shown above, E6 refers to the image for one and two thirds or $\frac{5}{3}$.

Click on the links to download sets of large cards

Print the cards and cut them out. Split your class into two teams and introduce the game by playing the face-up version **SHOW**, then progress to playing the face-down version, **HIDE**.

At the start players could just sort the cards into pairs. You can make the game easier when it is first introduced by playing with 6 pairs of cards, then later with 10, then 18 pairs.

- [Blank cards to make your own game](#)
- [One to Eight Memory Games for Early Years](#)
- [Addition Memory Game for Lower Primary](#)
- [Game 1 FI – Fractions and Images](#)
- [Game 2 FD – Fractions and Decimals](#)
- [Game 3 DI – Decimals and Images](#)
- [Game 4 FP – Fractions and Percentages](#)
- [Game 5 PI – Percentages and Images](#)
- [Game 6 DP – Decimals and Percentages](#)
- [Game 7 FDPI – All representations FDPI](#)

PELMATHISM RULES

SHOW Shuffle the cards and place them **face up** on a table, in rows and columns or just spread out. Players take turns to choose 2 cards. When they match, the player keeps the pair. If the cards don't match, the next player has a turn. The winner is the player with the most pairs when all the pairs of cards have been claimed.

HIDE Choose the cards for the version you want to play. Shuffle the cards and place them **face down** on a table, either in rows and columns or just spread out. Players take turns to choose 2 cards. When the cards match, the player keeps the pair and has another turn. If the cards don't match they are turned face down and the next player has a turn. The winner is the player with the most pairs when all the pairs of cards have been claimed.

Early Years

ONE TO EIGHT PELMATHISM

Copy and cut out a set of large cards. Start with just the cards for 1, 2 and 3. Ask questions about the colours, the footballs and the red squares on the cards. Pick out pairs of cards and ask what's the same and what's different about them. Let the children play with the cards. Show them how to arrange them in order and match the pairs of cards. Then play the Pelmathism game with just the 6 cards for 1, 2 and 3. When they know these numbers and how to play the game, gradually introduce the cards for the other numbers until the children can play the One to Eight Pelmathism game.

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 6 |
| 8 | 2 | 1 | 4 |
| 3 | 3 | 5 | 4 |
| 2 | 7 | 1 | 4 |

Lower Primary

ADDITION PELMATHISM

Play the One to Eight Pelmathism game as described for Early Years, then introduce and play the Addition Pelmathism Game.

Play the SHOW and HIDE versions as described above.

This is just an example. Blank cards are available for you to make your own game with numbers and operations suitable for your class.

| | | | |
|-------|--------|-------|-------|
| 2 + 3 | 2 + 4 | 2 + 9 | 2 + 6 |
| 5 + 5 | 2 + 10 | 5 | 9 |
| 11 | 7 | 6 | 2 + 7 |
| 12 | 8 | 10 | 1 + 6 |

Upper Primary

(1) Fractions and Images FI

| | | | | | |
|---------------|----------------|---------------|---------------|---------------|----------------|
| | $\frac{5}{12}$ | $\frac{5}{8}$ | $\frac{1}{2}$ | | |
| | $\frac{2}{9}$ | $\frac{5}{3}$ | | | $\frac{1}{3}$ |
| $\frac{3}{4}$ | $\frac{2}{9}$ | $\frac{5}{4}$ | | $\frac{3}{8}$ | |
| | $\frac{2}{3}$ | $\frac{7}{8}$ | | | |
| $\frac{4}{5}$ | | $\frac{1}{6}$ | | $\frac{1}{4}$ | |
| $\frac{6}{5}$ | $\frac{1}{10}$ | | | | $\frac{3}{10}$ |

FRACTIONS AND IMAGES PELMATHISM

Download, copy onto card, and cut out, the set of cards for this game. Give each pair of learners a set of cards in an envelope so that the cards can be collected at the end of lessons and used repeatedly.

The first task is for the learners to sort the cards into pairs. Next, they should play Fractions and Images Pelmathism with 6 pairs of cards to make the game easier, and later progress to playing with 10 pairs and then 18.

A similar version of the well-known Pelmathism game was originally published by NRICH and we use our versions here with permission of the University of Cambridge, all rights reserved. You can play the new NRICH interactive version of this game against the computer

<https://nrich.maths.org/problems/matching-fractions-decimals-and-percentages>

Lower Secondary

FRACTIONS DECIMALS PERCENTAGES AND IMAGES PELMATHISM

Plan to introduce these versions of Pelmathism when you teach lessons on the topics. Play with the whole class split into two teams or let the learners play in pairs or small groups. The games can be used as lesson starters for drill and practice, or for formative assessment or for revision.

(2) Fractions and Decimals FD (3) Decimals and Images DI

| | | | | | |
|---------------|---------------|---------------|---------------|-------|-------|
| $\frac{1}{2}$ | 70% | $\frac{5}{3}$ | 0.222 | 120% | 1.666 |
| 0.833 | $\frac{2}{9}$ | $\frac{5}{4}$ | $\frac{3}{4}$ | 62.5% | 0.7 |
| $\frac{5}{8}$ | 50% | 37.5% | $\frac{7}{8}$ | 150% | 0.6 |
| $\frac{4}{5}$ | 83.3% | 0.8 | 125% | 66.6% | 0.666 |
| $\frac{6}{5}$ | 75% | $\frac{3}{8}$ | $\frac{3}{2}$ | 60% | 0.875 |

| | | | | | |
|------|--------|-------|-----|--|-------|
| | 0.4166 | 0.625 | 0.5 | | |
| | 1.666 | | | | 0.333 |
| 0.75 | 0.222 | 1.25 | | | |
| | 0.666 | 0.875 | | | |
| 0.8 | | 0.25 | | | |
| 1.2 | 0.1 | | | | 0.3 |

(4) Fractions and Percentages FP (5) Percentages and Images PI (6) Decimals and Percentages DP

| | | | | | |
|---------------|----------------|---------------|---------------|---------------|----------------|
| 66.66% | $\frac{5}{12}$ | $\frac{5}{8}$ | $\frac{1}{2}$ | 166.66% | 16.66% |
| 150% | 10% | $\frac{5}{3}$ | 41.66% | 120% | $\frac{1}{3}$ |
| $\frac{3}{4}$ | $\frac{2}{9}$ | $\frac{5}{4}$ | 75% | $\frac{3}{8}$ | 87.5% |
| 62.5% | $\frac{2}{3}$ | 37.5% | $\frac{7}{8}$ | 80% | 30% |
| $\frac{4}{5}$ | 33.33% | $\frac{1}{6}$ | 125% | $\frac{1}{4}$ | 22.22% |
| $\frac{6}{5}$ | $\frac{1}{10}$ | 25% | $\frac{3}{2}$ | 50% | $\frac{3}{10}$ |






| | | | | | |
|------|---------|-------|-----|--|--------|
| | 41.66% | 62.5% | 50% | | |
| | 166.66% | | | | 33.33% |
| 75% | 22.22% | 125% | | | |
| | 66.66% | 87.5% | | | |
| 80% | | 25% | | | |
| 120% | 10% | | | | 30% |

| | | | | | |
|--------|--------|-------|--------|---------|--------|
| 66.66% | 0.4166 | 0.625 | 0.5 | 166.66% | 16.66% |
| 150% | 10% | 1.666 | 41.66% | 120% | 0.333 |
| 0.75 | 0.222 | 1.25 | 75% | 0.375 | 87.5% |
| 62.5% | 0.666 | 37.5% | 0.875 | 80% | 30% |
| 0.8 | 33.33% | 0.166 | 125% | 0.25 | 22.22% |
| 1.2 | 0.1 | 25% | 1.5 | 50% | 0.3 |

Upper Secondary

Download the full set of Pelmathism cards, cut them out and play the games as revision and to sharpen your memory skills.

This is a game where you must recognise the pairs and, importantly, remember where each card is placed. Concentration is essential! To play online you could use the map type references to refer to the cards. As a tough memory challenge you could even play the game blindfold.

| | | | | | | |
|---|---|-------------------|---|---|----------------------|---|
| 6 | 75% | $\frac{5}{12}$ | $\frac{5}{8}$ | $\frac{1}{2}$ | 37.5% |  |
| 5 |  | 70% | $\frac{5}{3}$ | 0.222 | 120% | $1.\overline{666}$ |
| 4 | $0.8\overline{33}$ | $\frac{2}{9}$ | $\frac{5}{4}$ |  | $0.1\overline{666}$ | 0.7 |
| 3 |  | $\frac{2}{3}$ |  | $\frac{7}{8}$ | 150% | 0.6 |
| 2 | $\frac{4}{5}$ | $83\frac{1}{3}\%$ | 10% | 125% | $41.\overline{66}\%$ | $0.\overline{666}$ |
| 1 | $\frac{6}{5}$ | $\frac{1}{10}$ | 0.8 | $\frac{3}{2}$ | 60% | 0.875 |
| | A | B | C | D | E | F |

Don't play in a hurry. When you turn over cards, take time to think of the other ways each number can appear and picture them in your mind. The other players can also see the cards and think about them, so everyone should be focussed on the game all the time if they want to win.

Note the different representations of the same rational number and as such each corresponds to the same point on the real number line. Between points representing rational numbers, there are infinitely many other points representing irrational numbers, that is real numbers that cannot be written in the form $\frac{a}{b}$ where a and b are integers.

We know examples of irrational numbers are π and $\sqrt{2}$, $\sqrt{3}$ and other square roots of numbers which are not square numbers.

Pelmathism is based on the game of Pelmanism played with a pack of standard playing cards. Many commercial pictorial versions have been marketed. The game was originally invented as a memory system in the 1890s by William Joseph Ennever. The system was taught by correspondence from the Pelman Institute in London. The belief was that memory training is important, like physical exercise for the body, and it leads to a healthy mind. The institute was supported by many of the prominent politicians and educationists of its time.

Create your own Pelmathism game for other topics. You can download a set of blank cards and create many variations of this game. For example, match pictures to the names of objects such as polyhedra, match calculations to the answers, match numbers to the same number written as a product of prime factors, or match diagrams to statements of theorems. There are many more possibilities.