

Sorting Cards: decimals, fractions and percentages.

Originally used as a starter activity in a pre GCSE maths class (Level 1 and Level 2 numeracy), after work on fractions and decimals but before work on percentages.

Instructions

Print pages 3-8, 12. Laminate and cut out. Alternatively keep some sheets whole or cut into strips.

We printed 3 copies of pages 2-3, each on a different coloured paper. When handing out cards give each pair of students percentage cards in one colour, fraction cards in another colour and decimals in the third colour. This makes the activity visually appealing and also means easy sorting at the end of the activity (see photo).

Pages 5-8 are probably best printed on white paper due to the pastel shading. Pages 9-11 are blank percentage squares for student or teacher use. They can be printed on paper for various shading exercises and are also very useful if printed on acetate and projected onto a whiteboard. Students can then come to the board and shade in various percentages or the teacher can colour in squares and ask students what percentage or fraction has been shaded.



Students worked in pairs as follows:

1. Give a set of decimal cards to each pair of students. Ask them to arrange them in ascending or descending order on the desktop. *(This took a lot longer than expected, even though we had previously covered ordering decimals).*
2. Now hand out the percentage cards and ask students to match them to their decimal cards. Suggest they start with ones they know, such as $50\% = 0.5$.
3. Ask students to discuss results in pairs. Can they see a connection? How do you convert between percentages and decimals? Discuss as a group.
4. The final challenge: hand out fraction cards and ask students to match them to the decimals and percentages (photo, top left). This proved difficult, even for level 2 students, but did provide some useful revision about simplifying fractions. For this reason I then decided to make the shaded percentage squares (pages 5-6) to use in a follow-up session.
5. When all three columns are matched – again ask students to discuss the connections between each column.



Differentiation and variations (see also notes on page 2)

Shaded fraction cards on pages 7-8 can be matched to the fraction cards on pages 3-4 (and the decimal cards if needed). Dividing lines have been removed so the more common fractions can be used at lower levels or before percentages have been introduced. (Some less obvious fractions such as $\frac{3}{20}$ or $\frac{61}{100}$ will not be clearly recognisable in these undivided squares but, for the sake of completion, a complete set is included on pages 7-8).



Alternatively, print pages 7, 8 or 12 (in colour) but do not cut out. Give each student a copy, along with an appropriate set of fractions (or decimals, or percentages) from pages 3-4. Student to put correct cards next to each fraction square (photo, bottom left).

Page 12 includes only common, easily identifiable fractions and is ideal for this activity (middle photo). If page 12 is laminated: students can write the equivalent fractions (or decimals or percentages) on the page using an erasable whiteboard pen.

Curriculum Links

Exact links will vary with how the cards are used.

N2/L1.1 Read, write, order and compare common fractions and mixed numbers

- (a) know common equivalent fractions, e.g. equivalent to a half, quarters, thirds, fifths, tenths
- (b) understand that in unit fractions, the larger the denominator, the smaller the fraction but that this is not true of non-unit fractions.

Use $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{8}$, $\frac{1}{10}$ cards from pages 3-4 and matching fraction squares from pages 7-8. Discuss. Compare with non-unit fractions (and matching squares) such as $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{3}{10}$, $\frac{3}{4}$. Compare $\frac{3}{4}$, $\frac{3}{5}$, $\frac{3}{10}$, $\frac{3}{20}$, etc.

N2/L1.3 Recognise equivalencies between common fractions, decimals and percentages. E.g. $50\% = \frac{1}{2}$, $0.25 = \frac{1}{4}$, and know how you use these to find part of whole number quantities.

- (a) know common fraction equivalents e.g. half, quarters, fifth, tenths.

Use the following cards only (and their matching fractions and decimals) along with appropriate fraction squares from pages 3-4, 5-6 or 12): 50%, 25%, 20%, 10%.

N2/L1.4 Read, write, order and compare decimals up to three decimal places

- (a) understand that the position of a digit signifies its value
- (b) know that the decimal point separates whole numbers from decimal fractions
- (c) know what each digit represents, including the use of zero as a place holder

Ask students to order all the decimal cards on pages 3-4. Optionally match to the fraction squares on pages 5-6. Use in conjunction with decimal place value charts (available on our site).

N2/L1.8 read, write, order and compare simple percentages, and understand simple percentage increase and decrease (a) understand percentage as the number of parts in every 100 (b) know that 100% is the whole (c) understand that a 10% pay increase is more than a 5% pay increase, but the actual increase depends on the number operated on.

Match percentage cards on pages 3-4 to the cards on pages 5-6.

N2/L2.2 Identify equivalencies between fractions, decimals and percentages.

- (a) understand that fractions, decimals and percentages are different ways of expressing the same thing
- (b) know that percentages are fractions out of 100
- (c) know that decimal fractions are expressed in tenths, hundredths, thousandths.

Use cards on pages 3-6 as described on page 1. Use decimal place value charts from our site.

N2/L2.3 Evaluate one number as a fraction of another

- (a) understand equivalent fractions (b) understand simplest form (c) know how to reduce a fraction to its simplest form, e.g. by recognising equivalent fractions, by using factors to "cancel"
- (d) recognise prime numbers i.e. numbers that can't be cancelled
- (e) understand that quantities must be in the same units to evaluate one as a fraction of another

Match fraction cards on pages 3-4 with those on pages 5-6 (or 7-8, or 12).

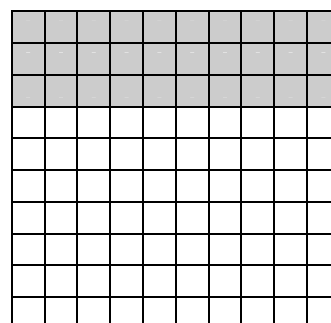
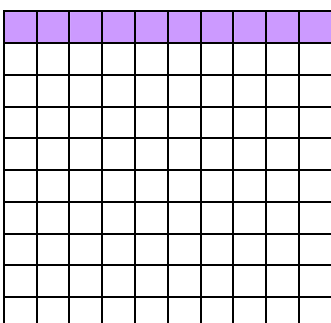
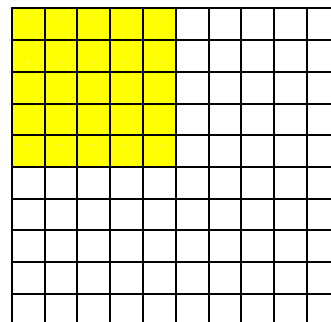
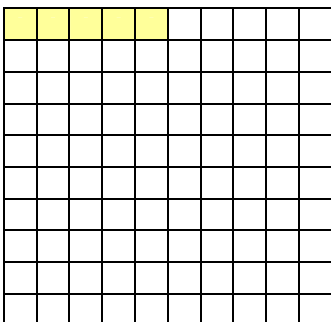
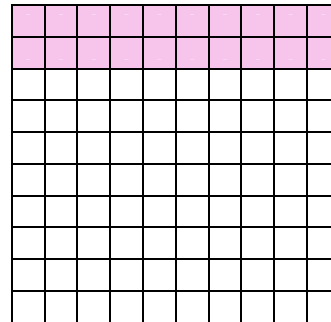
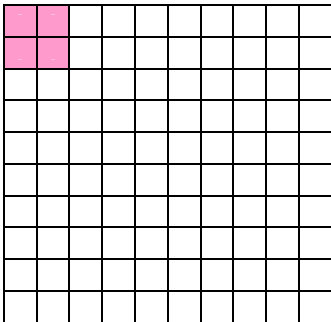
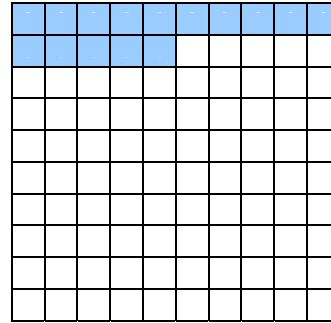
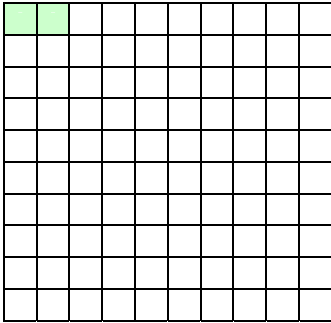
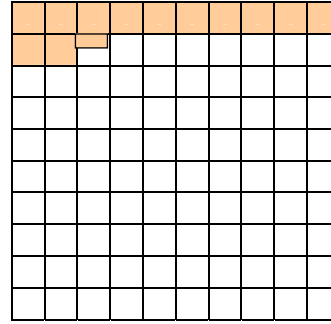
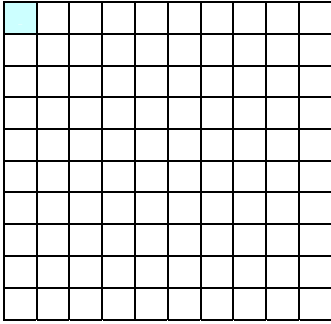
N2/L2.5 Order, approximate and compare decimals when solving practical problems

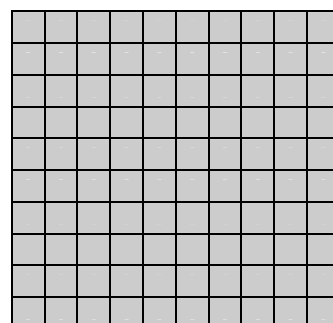
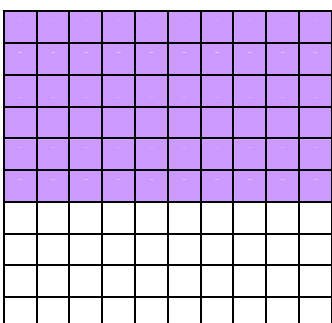
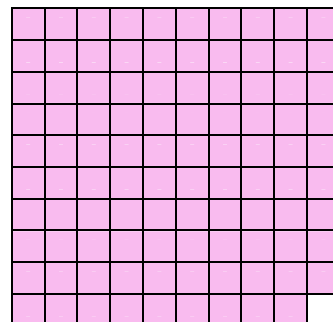
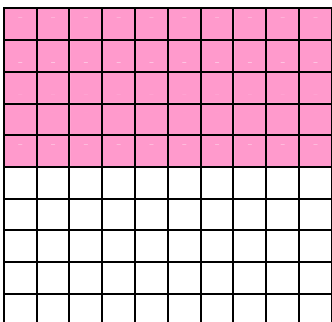
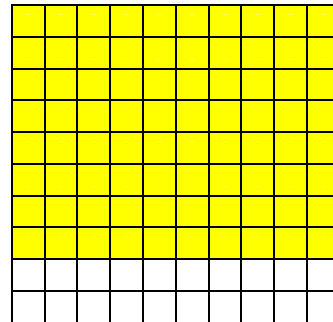
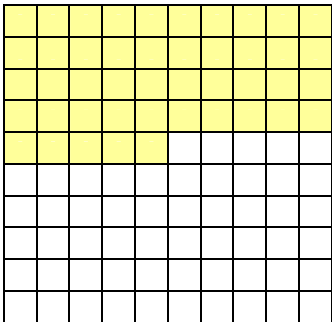
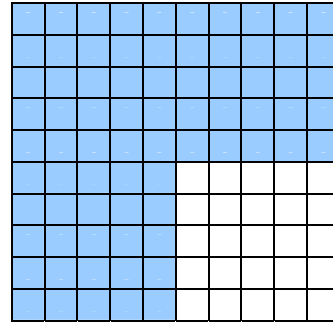
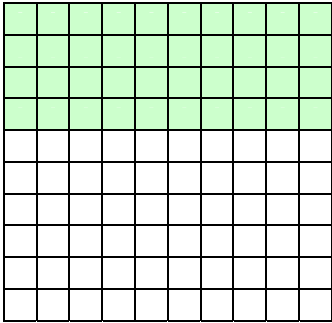
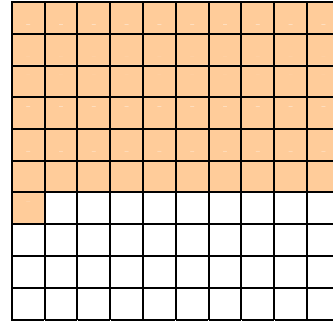
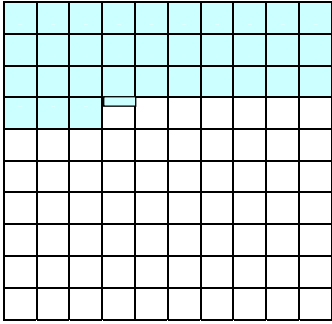
- (a) understand place value (whole nos. and up to 3 decimal places)
- (b) understand that decimals can be rounded to different degrees of accuracy, depending on purpose

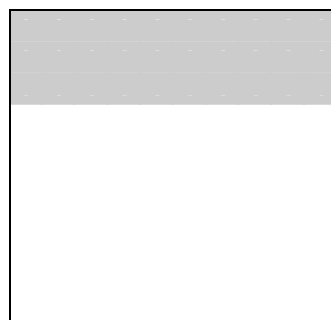
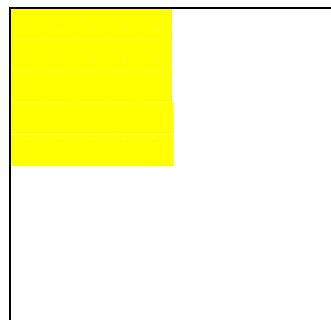
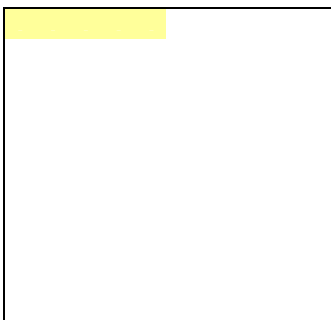
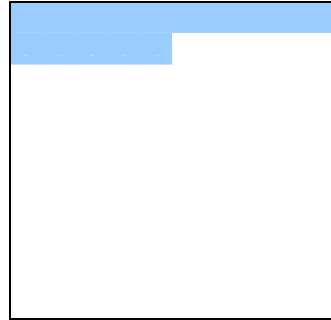
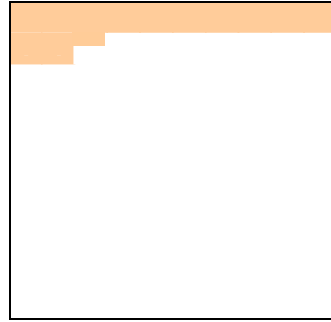
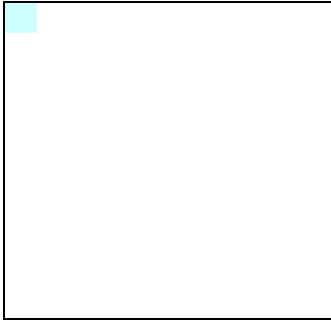
Ask students to order all the decimal cards on pages 3-4. Use in conjunction with decimal place value charts (available on our site).

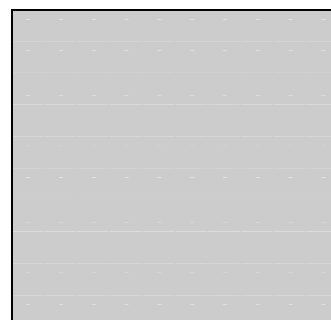
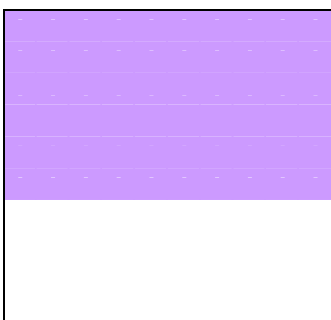
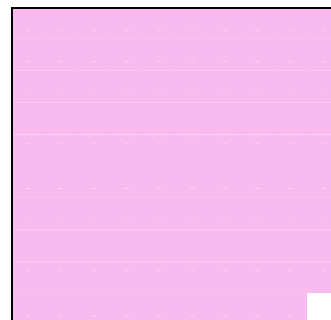
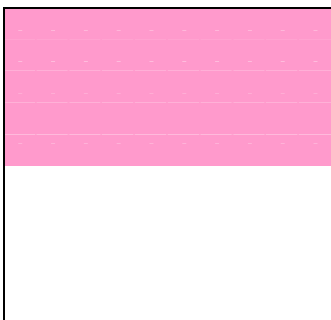
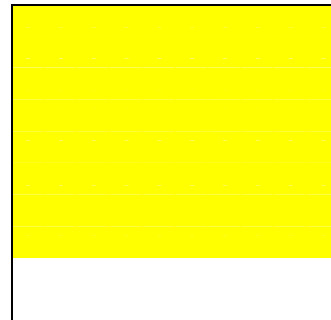
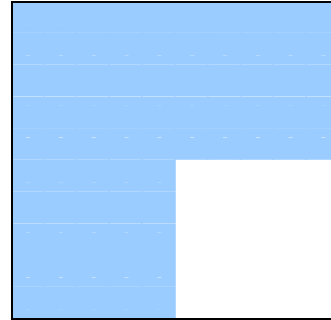
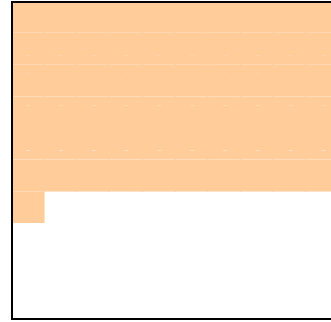
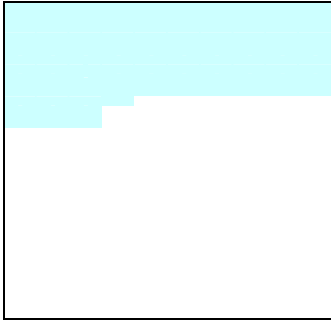
Percentage	Decimal	Fraction
1%	0.01	$\frac{1}{100}$
2%	0.02	$\frac{1}{50}$
4%	0.04	$\frac{1}{25}$
5%	0.05	$\frac{1}{20}$
10%	0.1	$\frac{1}{10}$
12.5%	0.125	$\frac{1}{8}$
15%	0.15	$\frac{3}{20}$
20%	0.2	$\frac{1}{5}$
25%	0.25	$\frac{1}{4}$
30%	0.3	$\frac{3}{10}$

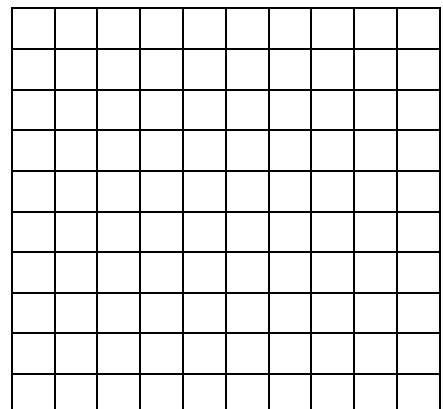
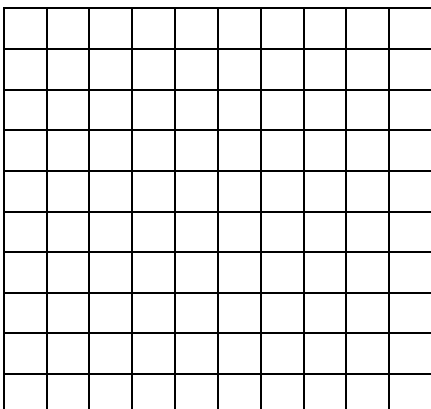
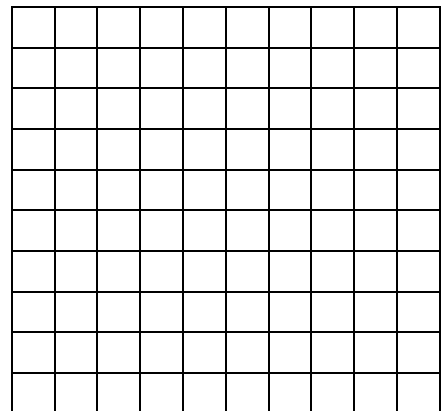
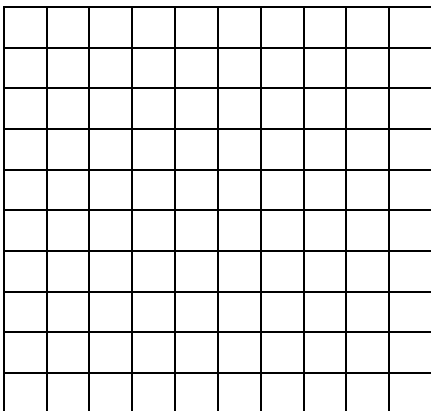
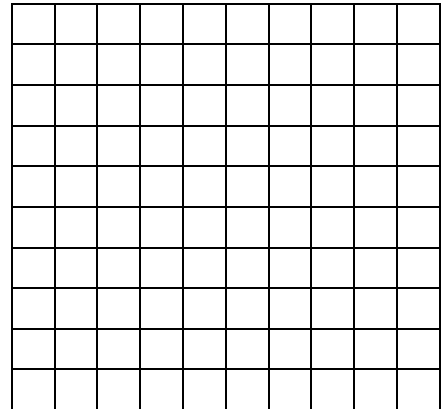
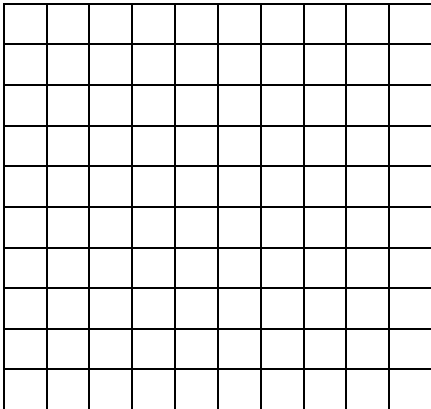
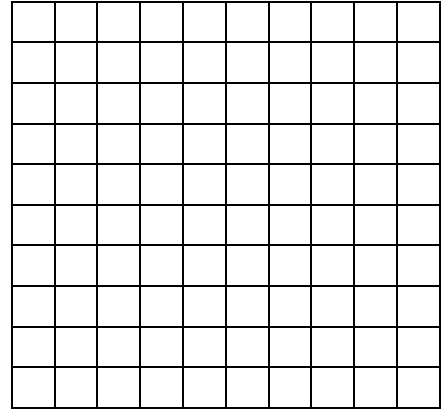
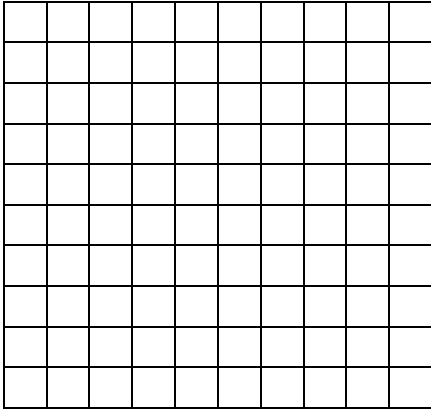
Percentage	Decimal	Fraction
$33\frac{1}{3}\%$	0.33	$\frac{1}{3}$
40%	0.4	$\frac{2}{5}$
45%	0.45	$\frac{9}{20}$
50%	0.5	$\frac{1}{2}$
60%	0.6	$\frac{3}{5}$
61%	0.61	$\frac{61}{100}$
75%	0.75	$\frac{3}{4}$
80%	0.8	$\frac{4}{5}$
99%	0.99	$\frac{99}{100}$
100%	1.0	$\frac{1}{1}$





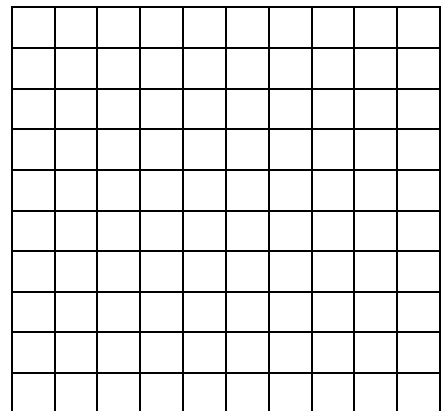
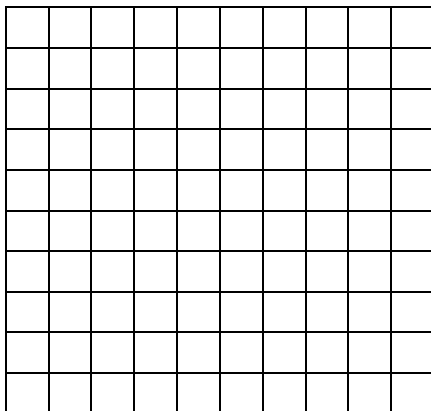
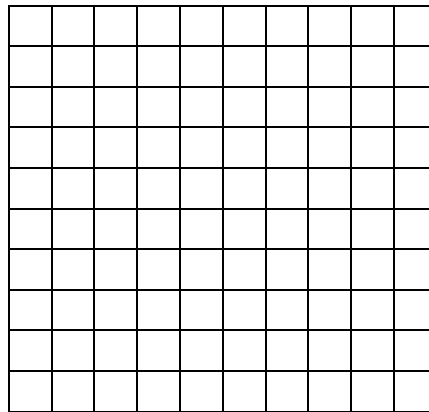
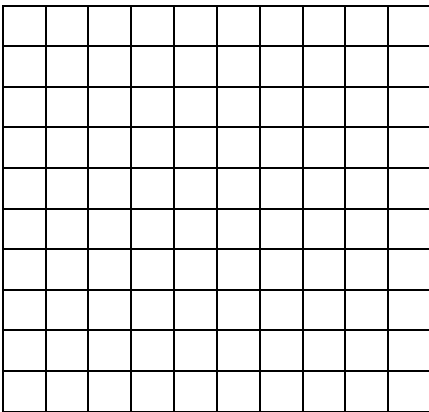
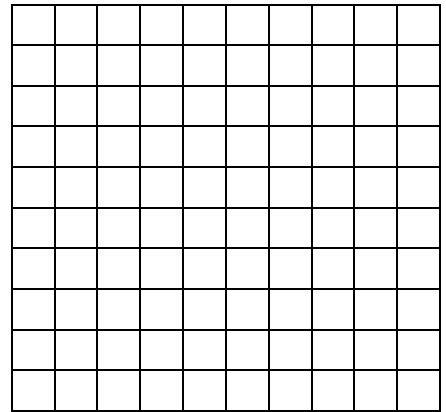
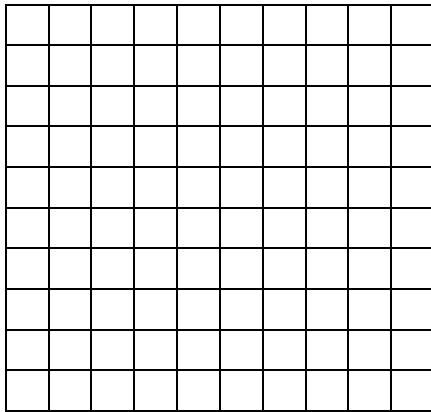
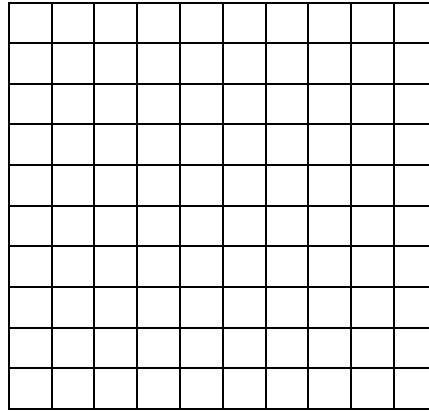
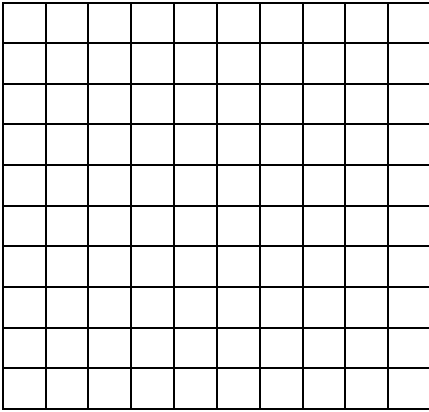


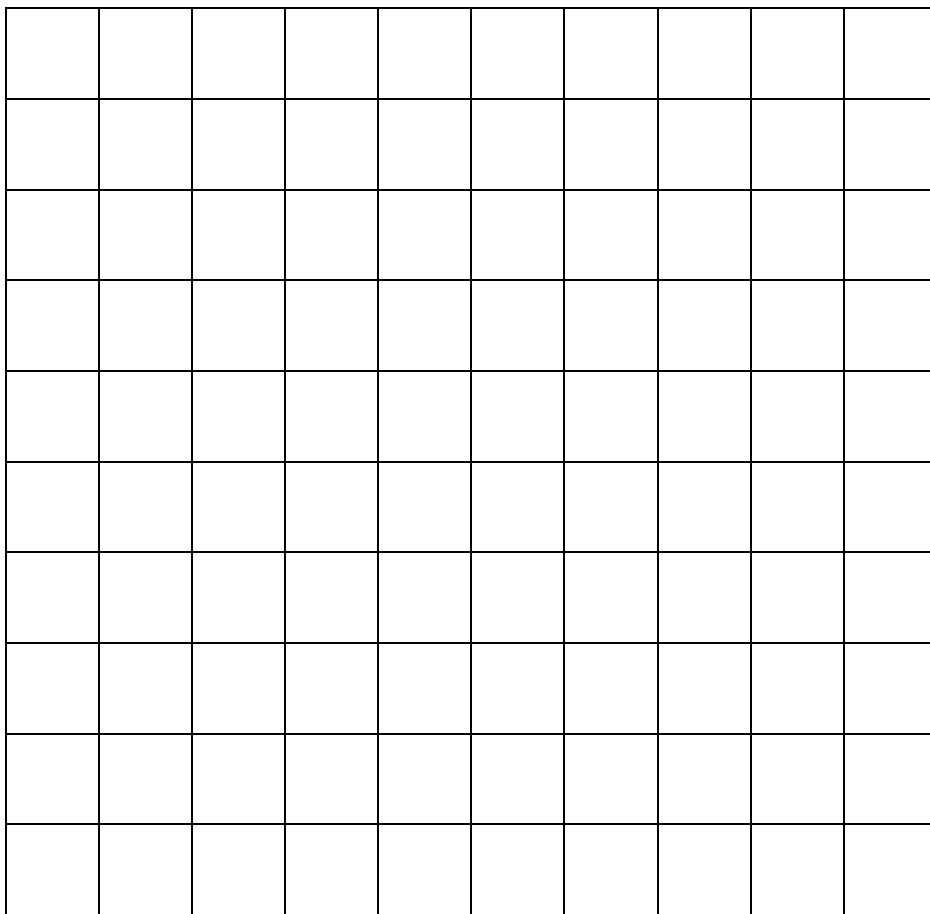
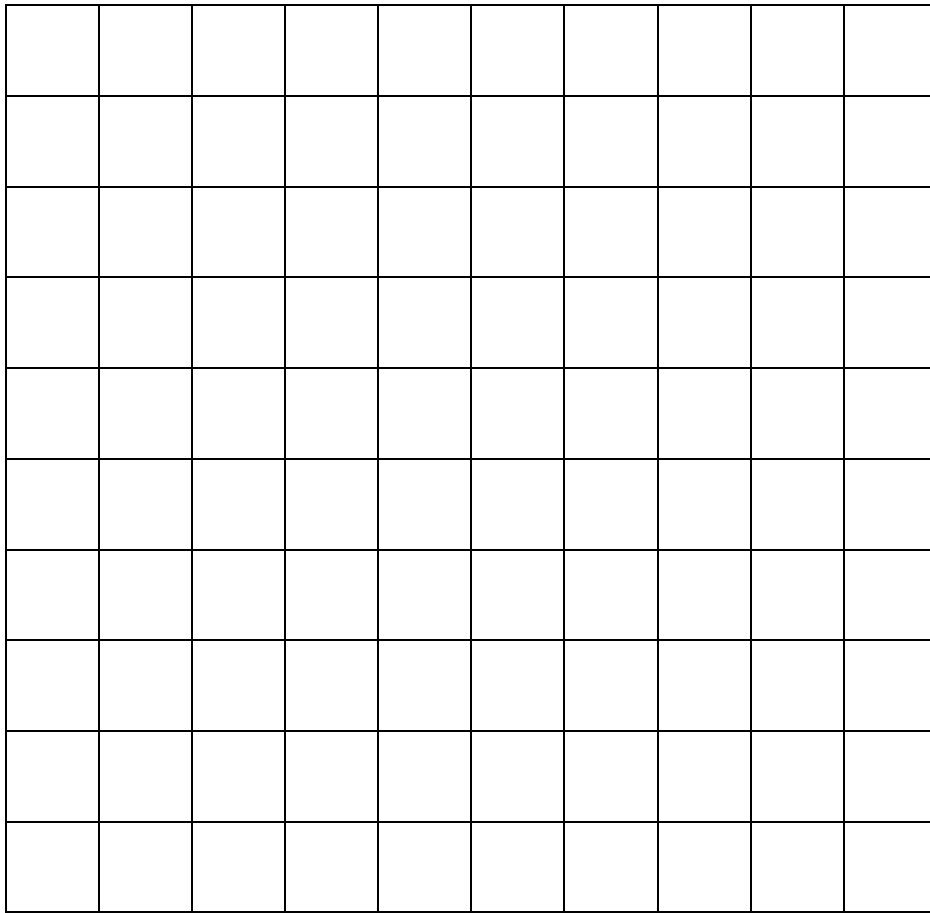




Blank percentage squares for student or teacher use.

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Blank percentage squares for student or teacher use. Print on paper or acetate.

