

Estimating Division

Developed with Judith Evans from Rosebery School in Loughborough. This grew out of a concern that children were learning methods of dealing with big number division, but were not really understanding how the numbers worked and how they could draw on a range of skills to find approximate answers. We wanted them to stop calculating blindly and cooperate in making healthy guesses, and while doing so, talk some maths and consolidate their understanding of place value. We have tried this out with Year 6, and children stayed on task and talked maths as they shared strategies and refined them.

The activity is now sound enabled from Mantra books

www.mantralingua.com

The webaddress for this activity is:

<http://www.collaborativelearning.org/estimatingdivision.pdf>

Activity last updated 5th October 2009

COLLABORATIVE LEARNING PROJECT

Project Director: Stuart Scott

Supporting a cooperative network of teaching professionals throughout the European Union to develop and disseminate accessible teaching materials in all subject areas and for all ages.

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BRIEF SUMMARY OF BASIC PRINCIPLES BEHIND OUR TEACHING ACTIVITIES:

The project is a teacher network, and a non-profit making educational trust. Our main aim is to develop and disseminate classroom tested examples of effective group strategies across all phases and subjects. We hope they will inspire you to use similar strategies in other topics and curriculum areas. We run teacher workshops, swapshops and conferences throughout the European Union. The project publishes a catalogue of activities plus lists in selected subject areas, and a newsletter available by post or internet: 'PAPERCLIP'.

*These activities were influenced by current thinking about the role of language in learning. They are designed to help children learn through talk and active learning in small groups. They work best in mixed classes where children in need of language or learning support are integrated. They are well suited for the development of speaking and listening. They provide teachers opportunities for assessment of speaking and listening and other formative assessment.

*They support differentiation by placing a high value on what children can offer to each other on a particular topic, and also give children the chance to respect each other's views and formulate shared opinions which they can disseminate to peers. By helping them to take ideas and abstract concepts, discuss, paraphrase and move them about physically, they help to develop thinking skills.

*They give children the opportunity to participate in their own words and language in their own time without pressure. Many activities can be tried out in mother tongue and afterwards in English. A growing number of activities are available in more than one language, not translated, but mixed, so that you may need more than one language to complete the activity.

*They encourage study skills in context, and should therefore be used with a range of appropriate information books which are preferably within reach in the classroom.

*They are generally adaptable over a wide age range because children can bring their own knowledge to an activity and refer to books at an appropriate level. The activities work like catalysts.

*All project activities were planned and developed by teachers working together, and the main reason they are disseminated is to encourage teachers to work effectively with each other inside and outside the classroom. They have made it possible for mainstream and language and learning support teachers to share an equal role in curriculum delivery. They should be adapted to local conditions. In order to help us keep pace with curriculum changes, please send any new or revised activities back to the project, so that we can add them to our lists of materials.

Estimating Division

Teachers' notes:

The connect four board is printed on two sheets of A4. We have done it this way to save the time of enlarging an A4 landscape to A3. Simply (this is the adverb most favoured by advertisers!) cut (or even more simply get some willing children to do it!) one edge off and paste them together. Make sure the left is on the left, and the right on the right because the easier solutions are round the edge and the more difficult solutions in the middle so that the game lasts for a while.

Try to encourage informed guesswork and discussion and discourage children from trying to work out exact answers. Many spaces on the board deliberately only need them to have a very rough idea. Initially as in the multiplication games we produced 25 cards to be printed in two colours and used by each pair. We have changed this to two sets of 15 cards with mainly different calculations for each pair. This was because the same calculation turned up too often and there was a fight for spaces on the board.

Gordon Ward, my colleague in Nottingham, suggested that we might produce two game boards: one with only fewer and more (or do we now all use more or less?), and another with between numbers (eg 30-35). It would certainly simplify the language demands. What do you think? Just email me: stuart.scott@collaborativelearning.org.

Do we need to produce a simpler or more difficult version of the game? Do send us any you or your class decide to produce!

Estimating Division Connect Four Board

15-20	75 - 100	20 - 30
25-30	<12	30 - 40
<50	55 -65	> 100
<100	20-30	<30

Left hand side of board -Cut this flap off

Glue this flap to the left side of the board

< 50

< 20

> 75

8-14

10-15

25-35

20-25

60-100

15-35

40-60

> 20

10-25

Estimating Division Connect Four Cards

$1400 \div 16$

$450 \div 18$

$300 \div 14$

$750 \div 47$

$1020 \div 30$

$990 \div 90$

$520 \div 29$

$300 \div 19$

$1000 \div 9$

$2100 \div 75$

$1000 \div 36$

$950 \div 11$

$900 \div 15$

$375 \div 25$

$560 \div 13$

Cards set 1 - print in two colours

Estimating Division Connect Four Cards

$200 \div 9$	$1200 \div 66$	$750 \div 45$
$600 \div 51$	$725 \div 25$	$1050 \div 70$
$510 \div 17$	$1000 \div 9$	$1000 \div 11$
$900 \div 29$	$360 \div 7$	$490 \div 70$
$440 \div 8$	$740 \div 35$	$800 \div 9$

Cards set 2 - print in two colours

HOW TO PLAY ESTIMATING DIVISION CONNECT FOUR

You need 4 people, one baseboard and two sets of cards (different colours.)

Work with a partner to make a team of two.

Place your cards in a pile facing down.

Take it in turn to turn over your top card and decide where to put it on the board.

The winning team gets four in row.

Decide whether to have challenges or a checking system.

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