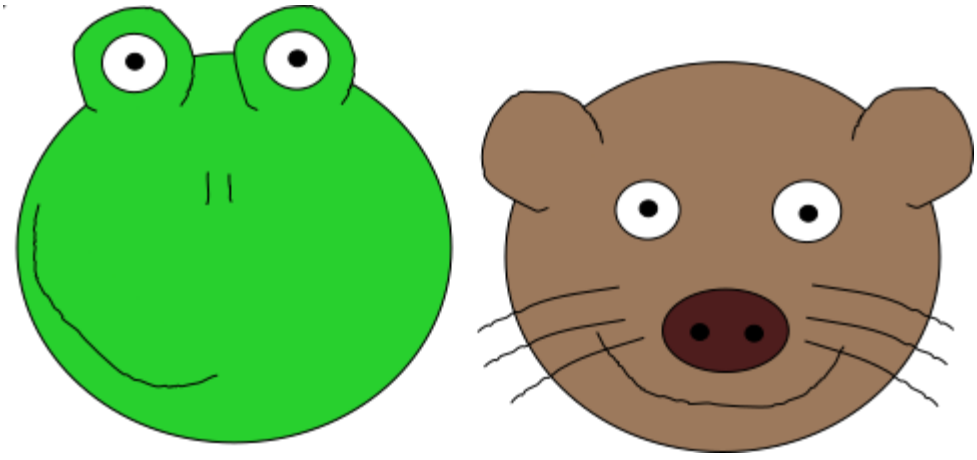
Frogotter Number Grid Activities



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Please note that this kit is not a toy.
It is a box of products intended for educational purposes
in a pedagogical context under the surveillance of an adult instructor.

Please don’t allow your child to play with the contents of this kit unsupervised.

The adult instructor should ensure they understand any potential hazards associated with the activities and determine whether they are suitable to use with the child under their care.

This kit contains small parts, which could be a choking hazard.

There is a small risk of burning if you short circuit the electronics kit, please take care.

Introduction

- I hope that you will enjoy using your Number Grid to explore numbers with your child. This booklet contains a few ideas of activities that you can do with your Number Grid.
- The Frogotter Method of learning is centred on the Three R's: Relax, Relate, Repeat.
- **Relax** - try to start the activity in a good mood yourself. Sit somewhere comfortable. Be encouraging and calm.
- **Relate** - there are lots of opportunities during the activities to learn about each other. Children learn well if they are sharing their learning with an adult they trust. Bring your own relationship into the learning.
- **Repeat** - learning takes time and repetition is incredibly helpful. All of the activities in the box are designed to be enjoyed several times. It is particularly important to repeat activities that your child finds tricky.
- Some of the Extension Activities require additional items. But, the most important resource is the adult working with the child. Children learn a great deal through conversation and play with adults. Much of the National Curriculum focuses on children expressing their ideas and listening to other people's ideas. The conversations that you have whilst completing the activities are a key component of education. You can model attentive listening and insightful questioning by taking an interest in your child's ideas.
- Though it can be fun to have a bit of a challenge, attempting activities that are far too hard is likely to demoralise your child and not to help them master new skills. Pay attention to non-verbal cues as well as what they're saying, so that you know when things are getting too tricky.

- If you have any questions or find the instructions unclear, there's a Frogotter Youtube channel with the activities demonstrated. You might find it helpful to watch the short video with your child if you get stuck.

Begin Adding

1. We can use a number grid to help us add numbers together.
2. Take six counters and three counters. Lay them out on the number grid, one on each square, starting at one. The counters should end on square nine.
3. Try using a few different combinations of counters.
4. We don't have to count out the groups again. If we want to add three to six, we can start with the number after six. Lay out three counters, starting on seven (you'll land on nine, again).
5. Try some more sums like this. The bigger the number, the more time you save by counting on, rather than laying out all the counters. Try adding four to fifteen.

Extension

Write out a long numberline and try counting on using that instead. You could use one of the frogs from the balance kit to 'hop' up the numberline. You can use any paper for a number line, but if you have a long roll of paper that can be a lot of fun. You could even make a huge numberline using pieces of paper taped together and walk up it to add.

Then have a go at taking away by walking (or hopping your toy) back down the numberline.

Board Game

1) Choose a counter each and put them on the number one.
2) Take it in turns to roll the die and move that number of spaces forward.
3) The winner is the first person to get to 100.
4) If you roll past 100, go backwards, you have to land exactly on 100 to win, (e.g. if you were on 99 and rolled three, you would count one forward to 100, then two back, landing on 98).

Extension

Add some rules of your own, to make the game more fun. For example if you land on your age, you get to roll again; or if you land on a number with ‘2’ in it you have to move backwards one your next go.

Speed Compare

1) Lay a white board (or piece of paper) down on the table. Put a pile of three counters on the left of the board and six counters on the right of the board. Which pile is bigger?
2) The right side has the bigger pile, so write this symbol on the board: <
3) Now put five counters on the left of the board and two counters on the right. Which pile is bigger?
4) The left side has the bigger pile, so write this symbol on the board: >
5) Now put four counters on each side of the board. Both piles are the same, so write this symbol on the board =
6) Take it in turns to lay out the piles or to compare the sizes and write the correct symbol as quickly as you can.

7) If you have trouble remembering which way round it goes, you can think of the ‘greater than’ and ‘less than’ symbols as like greedy mouths, always open to gobble up the biggest number.

Extension

If you have cups, mugs and bowls of different sizes, try pouring different amounts of water into them and see if your partner can guess which container is holding the most water.

Rounding

1) Put a counter on the number ‘3’ on the number grid. Which is is closest to: 0 or 10? NB you have to imagine the zero, it belongs to the left of the one.
2) Now put the counter on the number ‘7’ on the number grid. Which is it closest to: 0 or 10?
3) We call this ‘rounding to the nearest 10.’ We take a number and say which number in the ten times table it is closest to. Now put a counter on the number ‘5’, which is this closest to: 0 or 10? It’s exactly in the middle. When this happens, we always round up, so 5 to the nearest 10 is 10; 25 to the nearest 10 is 30; 385 to the nearest 10 is 390.
4) Have a go at rounding these numbers to the nearest ten, you can use the number grid if you need to: 67; 4; 89; 75; 22; 31.
5) Can you round to the nearest hundred? The number grid doesn’t go higher than 100, so you’ll have to try without it. Try these: 234; 199; 101; 89; 3.

Extension

Try rounding some real life numbers. Get a recipe book and round all the weights to the nearest ten, and to the nearest 100. If you're feeling bold, try cooking your rounded recipe. Does it make much difference?

Square Numbers

1) Get out the counters, what shape are they? They're squares. If you lay four squares together, with their edges touching, you should be able to make a big square. Can you do that?
2) If you lay nine squares together, you should be able to make another big square. Try to do that.
3) Four and nine are square numbers. They are the result of one number multiplied by itself, 2x2=4, 3x3=9. Can you find the next square number? (You can find all the square numbers up to 10x10 with your counters.)
4) You don't have to build a new square each time, you can move from one square to the next just by giving your square one more row and one more column.

Extension

If you have some cardboard, you can make yourself some cardboard cubes, and demonstrate cubic numbers. Make eight cubes. You can build your small cubes into a big cube by making one square of cubes, two wide and two long, then putting an identical square on top. You will now have a cube that is two high, two wide, two long, made up of eight smaller cubes. 2x2x2=8. The next cube number is 27 (3x3x3), which is rather a lot of cubes to make, but, if you have a box of sugar cubes, or a big box of blocks, you might be able to build it!

Animal Picnic

1) Pick your two favourite animal toys. They're going to have a picnic.
2) First they have four sandwiches to share. Take four counters and share them fairly between the two animals. How many does each get?
3) Now they have six tomatoes to share. Take six counters and share them fairly. How many does each animal get?
4) They have two packets of crisps. Share two counters between the animals.
5) They have eight biscuits. Share eight counters.
6) Finally, the animals have fourteen grapes. Share fourteen grapes between the two animals. How many grapes does each eat?
7) Have another picnic, for three animals. They have six sandwiches, nine tomatoes, three packets of crisps, twenty one biscuits and thirty grapes.
8) Hold a picnic for four animals. Share out eight sandwiches, twelve tomatoes, four packets of crisps, sixteen biscuits, and twenty grapes.

Extension

If you have a packet of sweets, you can hold a real picnic. Try sharing them between two animals first, then three, then four. If you have any remainders - you should eat them. At the end of the pretend picnic, you should eat all the sweets.

Times Table Hunt

1) Two Times Table. Put one counter on two and one on four. Continue putting your counters down until the entire two times table is covered. What do you notice about the counters? What pattern do they make? Put a different coloured counter on top of the four, the eight and so on, covering every other one of the counters that you have laid down - that's the four times table. If you cover the eight, the sixteen, and so on, covering every other pile of two counters you will have three counters on top of every number in the eight times table.
2) Take all those counters off and start over, putting one counter on three, one on six, and so on, covering every third counter, then you will have covered the three times table. There aren't columns like there were with the two times table, but the counters still make a pattern. If you put the two times table down again, you will see that every number with two counters on it is in the six times table.
3) Take all those counters off and start over. Try putting counters on all the numbers in the five times table. What do you notice? All the numbers in the five times table end with one of two possible digits, what are they? Notice that the five times table makes columns again. If you put counters on ten, and then every other number in the five times table, you'll discover the single column of the ten times table.
4) Take all those counters off and start over. Starting with eleven, count out eleven and lay down the counters to show the eleven times table.
5) Take all those counters off and start over. If you lay out the three and the four times tables, the numbers where they meet will be the twelve times table.

6) When you've looked at the patterns made by all the different times tables up to twelve, try putting one counter on every number in the two times table, then one on every number in the three times table (but, don't put a second one on top of any numbers also in the two times table). If you keep going until all the numbers in a times table are covered by a single counter, the uncovered numbers are called Prime Numbers, what you just did is called the Sieve of Eratosthenes, it's a simple method for discovering prime numbers.

Extension:
Copy out one of the times tables onto a piece of paper and stick it up somewhere you will see it. If you practise every day, you will be able to memorise your times tables, which will be very helpful for maths problems later. It's easiest to try and learn only one times table at a time. But, remember that 3x4 is the same as 4x3, so once you've learned one times table, you'll have fewer sums to learn in the next one! If you were to learn all your times tables up to twelve, by the time you get to the twelfth one, you'll only have one sum left to learn, because all the rest are in your other tables!

Percentages

1) A percentage is just a fraction with a fun name: percentage means out of 100. If you lay fifty counters out on your number grid, covering the numbers 1-50, you'll have covered 50% of the grid.
2) Can you lay out counters to cover 30% of the grid? How about 75%, or 15%?

3) If you want to take away a percentage from the whole grid, just start at the other end. For example, to take away 10%, lay out ten counters, starting at 100, and going backwards to 91.
4) The biggest number left uncovered (in this case 90) is the answer 100%-10%=90%
5) Can you do these sums: 100%-45%; 100%-15%; 100%-25%?
6) If you want to find a percentage of another number, it's the same as finding any fraction of that number. First divide by the bottom of the fraction (with a percentage, the bottom number is always 100), then multiply by the top number. So,

20% of 300 = 300 ÷ 100 x 20
= 3x20
= 60

7) Can you find these percentages of these numbers: 10% of 500; 30% of 200; 15% of 400?
8) Sometimes, when you divide by 100, you get a decimal, you can still find a percentage. For example: 20% of 450 = 450 ÷ 100 x 20

= 4.5x20
=90

9) Can you find these percentages of these numbers: 10% of 630; 20% of 450; 40% of 220?

Extension

Shops sometimes have sales where they promise a certain percentage off a price. If you can find one of these sales - either in store or online - you can work out the new prices together.

Have a look in your cupboards and see if you can find anything with ‘20% extra’ or ‘10% less sugar’. See if you can work out how much extra you’ve got, or how much sugar has been taken out.