The History of Mathematics - BBC doc (part1)

http://www.youtube.com/watch?v=WD1CXzTbUtA

Listen to and watch the video, then fill in the missing expressions in the statements.

1) In his studies of maths, the speaker is especially interested in ....

2) Give examples of patterns and sequences which occur in the world.

   ....

3) The most basic concepts of maths are ....

4) Also animals understand ....

5) People around the Nile river started to settle around ....

6) The most important event in Egypt was ....

7) People used this event for ....

8) People of Egypt needed to calculate or measure................................

9) Egyptians used their .... for measurements.

10) It was important to know the area of farmer´s land so that it could be ....

11) The first numbers in history were ....

12) They used a .... number system because they used their 10 fingers.

13) There was, however, no concept of a ....

14) Million minus 1 has .... characters in total.

15) The .... is the most important mathematical document

    form ancient Egypt.

16) The speaker demonstrates how to calculate ....

17) The interesting thing is that the second number is described in ....

NUMBERS AND MEASUREMENTS

SIMPLE ARITHMETIC

Look at the way we say these examples

$4+4 = 8$	four and four is eight
$9-2 = 7$	nine minus two is seven
$5\times5 = 25$	five times five is twenty-five
	or five multiplied by five is twenty-five
$8\div4 = 2$	eight divided by four is two

1. *Now read these aloud*

a) $12+7 = 19$ b) $15\div3 = 5$ c) $6\times2 = 12$ d) $23-6 = 17$
e) $9-3 = 6$ f) $6+3 = 9$ g) $28\div4 = 7$ h) $8\times9 = 72$
i) $3\times8 = 24$ j) $12-4 = 8$

ARITHMETIC

Here are some more arithmetical symbols. Notice how to say them.

2^2	two squared
2^3	two cubed
2^4	two to the power of four

This is how we say fractions

$\frac{1}{2}$	a half	$\frac{1}{3}$	a third
$\frac{1}{4}$	a quarter	$\frac{3}{5}$	three fifths
$\frac{3}{4}$	three quarters	$2\frac{1}{2}$	two and a half

$\sqrt{}$	square root
$\sqrt[3]{}$	cube root
π	pi

1. *Now read these aloud*

$5\frac{3}{4}$, $2\frac{3}{4}$, $10\frac{1}{4}$, $\frac{3}{5}$, $1\frac{3}{5}$, $4\frac{3}{4}$

Look at this example

$5+4 = \ldots$ *How much is five and four?*
Five and four is nine.

2. *Ask and answer questions about these in the same way.*

Work with a friend.

a) $12-6 = \ldots$ e) $\sqrt{16} = \ldots$ i) $\sqrt[3]{27} = \ldots$
b) $9\times5 = \ldots$ f) $4+7\frac{1}{4} = \ldots$ j) $2^4 = \ldots$
c) $30\div6 = \ldots$ g) $3\frac{1}{4}+6\frac{1}{4} = \ldots$ k) $\pi = \ldots$
d) $4\frac{1}{4}+6\frac{1}{4} = \ldots$ h) $9^2 = \ldots$ l) $2\frac{1}{4}\div2 = \ldots$

FRACTIONS AND DECIMALS

Parts of a whole number can be expressed as fractions or as decimals. Notice how we say the decimals:

$\frac{1}{2} = 0\cdot5$	(nought point five)
$1\frac{3}{4} = 1\cdot75$	(one point seven five)
$3\frac{8}{10} = 3\cdot8$	(three point eight)
$\frac{874}{1000} = 0\cdot874$	(nought point eight seven four)

and the measurements:

$0\cdot643$ g = point six four three of a gramme
$1\cdot385$ cm = one point three eight five centimetres.

1. *Change these fractions into decimals*

a) $\frac{1}{2}$ b) $4\frac{1}{2}$ c) $6\frac{1}{4}$ d) $7\frac{1}{2}$ e) $\frac{3}{4}$ f) $\frac{1}{16}$
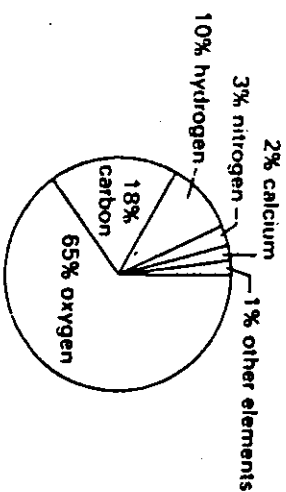
Look at the way we say this example 1 km = $0\cdot621$ miles one kilometre equals nought point six two one miles

PERCENTAGES

We can express parts of a full quantity as percentages (%).

Look at this example

65% (per cent) of our body weight is oxygen.

2% calcium
3% nitrogen
10% hydrogen
18% carbon
1% other elements
65% oxygen

1. *Now use the diagram to make more sentences about the composition of the body. Make a similar diagram and sentences about the composition of the atmosphere.*

MENTAL ARITHMETIC

Mental arithmetic is done in your head, not on paper. Practice in mental arithmetic will help you to think quickly in English.

Look at this example

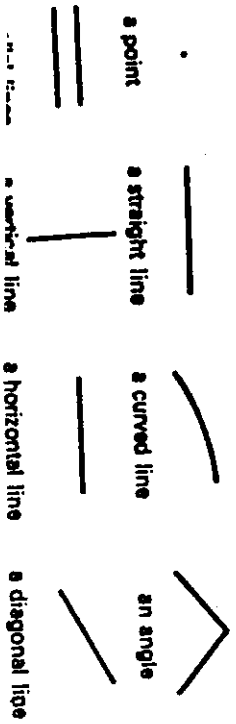Add six to seven. Now multiply by four. Subtract four. Divide by twelve. What is the answer? *Four.*

Here is the process in numbers and symbols: $6 + 7 = 13$, $13 \times 4 = 52$, $52 - 4 = 48$, $48 \div 12 = 4$.

1. *Now work with a friend to do these exercises. One of you should have his book open and ask the questions. The other should have his book closed and give the answers. See how quickly you can do it.*

   a) Multiply 7 by 9. Add 9. Divide by 6. Subtract 3. What is the answer?
   b) Subtract 8 from 24. Divide by 2. Add 2. Multiply by 10. What is the answer?
   c) Take the average of 20, 24, 26 and 30. Multiply by 10. What is the answer?
   d) Take 50% of the pupils in your class. Multiply by 2. Divide by 4. What is the answer?
   c) Divide 20 by 5. Multiply by 9. Add 32. What is the answer?
   f) Multiply 7 by 4. Add 20. Subtract 6. Divide by 6. What is the answer?
   g) Take the square root of 36. Add 14. Multiply by 5. Subtract 1. What is the answer?
   h) Take the square root of 81. Add the square root of 16. Multiply by 12. Divide by 4. What is the answer?
   i) Calculate the volume of a rectangular solid with a length of 10 cm, a height of 8 cm and a width of 5 cm.
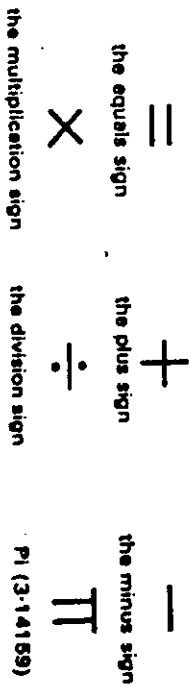   j) What is the length of a box which has a volume of 144 cc, a height of 4 cm and a width of 3 cm?
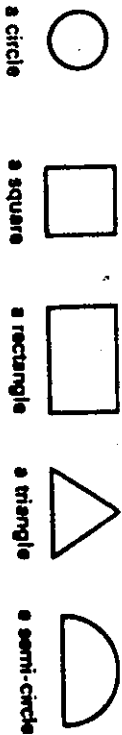
The letter 'E' has one vertical line and three horizontal lines. It also has four angles.

Which of these letters are described below?

   D, M, C, H, F, L, Z, B.

   a) A letter with 2 horizontal lines and 1 vertical line.
   b) A letter with 1 curved line and no straight lines.
   c) A letter with 2 curved lines and 1 vertical line.
   d) A letter with 2 parallel vertical lines, 1 horizontal line and 4 angles.
   e) A letter with 2 vertical lines and 2 diagonal lines.

Now write sentences describing these signs:

the equals sign	the plus sign	the minus sign
the multiplication sign	the division sign	Pi (3·14159)
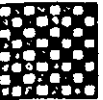
2. Look at these figures and answer the questions:

a circle   a square   a rectangle   a triangle   a semi-circle

   a) Which figure is curved?
   b) Which figures have parallel sides?
   c) Which figure always has equal sides?
   d) Which figure may have equal sides?
   e) Which figure has 3 angles?
   f) Which figure has a curved side and a straight side?

Now make sentences from the table:

Example: A coin is shaped like a circle. It is circular in shape.

A coin			square.		rectangular
A ruler			rectangle.		circular
A set square	is	shaped like a	semi-circle.	It is	square	in shape.
A protractor			triangle.		semi-circular
A chess-board			circle.		triangular

Section 1 One-dimensional and two-dimensional shapes

1. Look at these:

a point   a straight line   a curved line   an angle

a vertical line   a horizontal line   a diagonal line

Unit 1

Studying at University

Lesson 1 – Making New Friends

Functions: 1. introduction oneself – informal
2. identifying oneself (previous studies, current studies)
3. introducing others – informal
4. asking for / giving information

Vocabulary: interests, likes, dislikes, life style, higher education

Task 1: a) Prepare some questions for your partner to learn more about him / her. Try to be original.
b) Decide what you would like to tell the others about yourself (something interesting, attractive, amazing ..., something they will remember)

Task 2: a) Work in pairs. Ask and answer questions about each other. Také notes to be able to introduce your partner to the others.
b) In front of the class introduce your partner to the others.

Task 3: Read and listen to the text about Libor Novák, a student of Masaryk University in Brno.

Libor Novák, a student talks about himself. Hello. My name is Libor Novák and I come from Jeseník, a small town with a population of about 10,000, in the mountains of nothern Moravia but I'm currently living and studying in Brno. I study Chemistry at the Faculty of Science, which is very demanding but I am enjoying the challenge. I'm in the second year of a five year course which means that next year I'll be able to start specializing by choosing options in those areas which interest me most.
Before coming here I attended the grammar school in Jeseník where my favourite subjects were Mathematics and Chemistry. On the other hand, I found languages more difficult and had to put in a lot of extra work to pass my schoolf leaving exams.
At the moment I am living in the halls of residence in Komárov although next year I will have to leave and find a place to stay privately since there are not enough rooms for all the students who want them. I share a double room with another student from Jihlava called Radek Kašpar who studies Geology. He would have studied Physics if it had been possible but he didn't get a high enough mark in his eʃtrance exams.

Task 4: Complete the questions about Pavel Zemánek.

1. Where .... from?
2. What .... do?
3. What .... research .... ?
4. Why .... updating his C. V. ?
5. What .... like to do?
6. Where .... living?

7. Who .... he .... to share a flat ....?
8. Why .... he .... to share a flat?

Task 5: Listen to the text about Pavel Zemánek and answer the questions (task 4).

Task 6: Work in pairs. Ask and answer questions about Libor Novák.

Task 7: Grammar revision – the present simple & the present continuous

Task 8: Vocabulary from task 3 and task 5

Task 9: a) Prepare a short talk about an imaginary student of the Faculty of Science.
b) Work in groups of 4 – 5, tell the others about your student, choose the best, tell the class
c) Choose the most original talk.

QUESTIONNAIRE

LEARNING A LANGUAGE: EXPERIENCE AND EXPECTATIONS

Think about your previous experience of learning a language. Tick (✓) the sentences that are true for you:

1 Learning a language

involves hard work ☐	is painful ☐	is easy ☐
is interesting ☐	is confusing ☐	comes naturally ☐
is difficult ☐	is boring ☐	requires a lot of memorization ☐
is frustrating ☐	can be a lot of fun ☐	

2 When I am speaking a foreign language I:

feel shy ☐	feel confident ☐	feel embarrassed ☐
feel frustrated ☐	feel challenged ☐	feel tongue-tied ☐
feel stupid ☐	feel happy ☐	feel as if I am a different person ☐

3 Learning a language in class involves:

reading a passage and answering questions ☐	frequent tests ☐
	final tests
	role play, mime, and drama ☐
translating a passage ☐	following a textbook ☐
reading literature ☐	making a newspaper ☐
writing grammar exercises ☐	letter writing ☐
doing a project ☐	practising speaking in pairs or groups ☐
learning about British culture ☐	
learning grammar rules ☐	listening to a tape and answering questions ☐
dictation ☐	
listening to the teacher ☐	games ☐
acting a play or a dialogue ☐	repeating in chorus ☐
memorizing passages ☐	practising pronunciation ☐
making a TV or radio programme ☐	class discussion and debates ☐
reading aloud ☐	songs ☐
learning lists of vocabulary ☐	writing stories or essays ☐

Now go back to the beginning of the questionnaire. Mark with a cross (×) the sentences that you expect will be true of the language course you are about to follow.

(left column, partially visible)

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