UNITED KINGDOM MATHEMATICS TRUST

Open Ended Tasks

These are open ended questions and are not intended for use in a competition format.

It is expected that these will be used in the classroom with groups of pupils and would foster research on the part of the pupils (and maybe the teacher!).

Some guidelines are given but the intention is for the pupils to do some research by whatever means is appropriate, other than simply asking someone else.

Task One

Sharing toys

Adam and Ben have 17 toys between them.

Some toys have been specifically bought for them, others they have to share.

Adam, being the elder, has twice as many toys as Ben.

What is the least amount of toys that they share? What is the maximum number of toys they could share?

Investigate for any odd number of toys in total.

Can you generalise for any number of toys?

Task Two

Who is right?

How many different types of triangle are there?

Someone suggests “there are a lot of different types of triangle”. Why would they say that?

Some teachers are having the same discussion concerning this question.
One teacher says “there are only two types of triangle.”
Another says “there are seven different types of triangle.”
While someone suggests “there are a lot of different types of triangle.’’

What statement would you make and why? Work with your classmates and try and explain your reasons.

How many different types of quadrilateral are there?

Task Three

Interesting date!

The 29th of November 1992 could be rewritten as:

29-11-92

Some would call this date palindromic as it reads the same backwards as forwards.

What was the last palindromic date before 29-11-92?

When was the most recent palindromic date?

When is the next one?

Task Four

Maximising Output

Using the digits 1, 2, 3, 4 and 5 exactly once and once only, make two or more numbers:

e.g. **5, 12 and 34**

Multiply these numbers together: **5 × 12 × 34 = 2,040**

Try other arrangements of the digits 1 to 5.

What is the **greatest** product that can be made?

Task Five

All is NOW fair and square!

Amy doubles the amount of money Betty has.
i.e. Amy gives Betty as much money as Betty already had.

In turn, Betty doubles Chris' money.
Who in turn, doubles Debbie's money.

Debbie thinks it only fair now to double Amy's money, because that way they will all end up with £16 apiece.

How much did each start with?