RI Christmas Lecture 2008:1 Investigation

Watch the lecture at http://bit.ly/1PYmTjt and answer the following questions:

If cars had developed at the same speed as computers how fast does Chris say they would be able to go today? And how far on a litre of petrol?

How many components are there on the microprocessor chip that Chris displays?

How long is a nanosecond?

How many calculations could a chip do in the time the pellet took between the targets?

Conclusion:

Computers are extremely fast and they're getting faster every year. And it's this amazing growth in power that's fuelled the digital revolution. It's transformed the nature of entertainment, of communications, of health care, in fact almost every aspect of our lives has been touched or even revolutionised by the microprocessor.

Computer circuits are built of millions of switches made from semi-conductors. What is a semi-conductor?

What were early computer circuits made out of?

What is an 'integrated circuit'?

What does Moore's Law state?

How are complex circuits with billions of switches etched onto such tiny chips?

With a clock speed of 3GHz, how many times can transistors switch on/off in a second?

Computers started hitting a big problem a few years ago. Why can't speed still increase?

How have recent chip inventions got round this?

RI Investigation (continued)

Research:

Find out the specification of a pc or smartphone. What clock speed has it? How many 'cores' or processors has it? How much RAM? How big is the backing storage? How much has already been used?
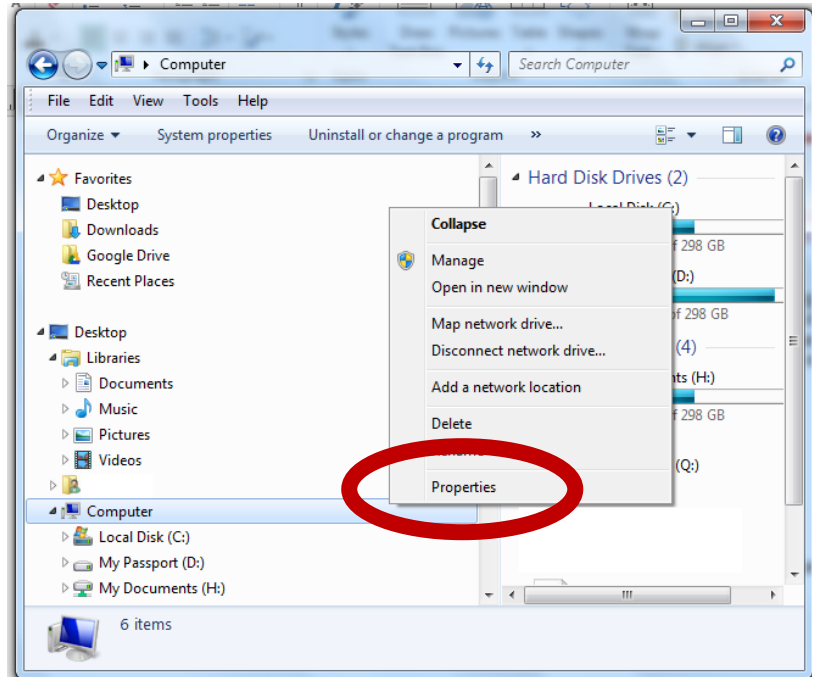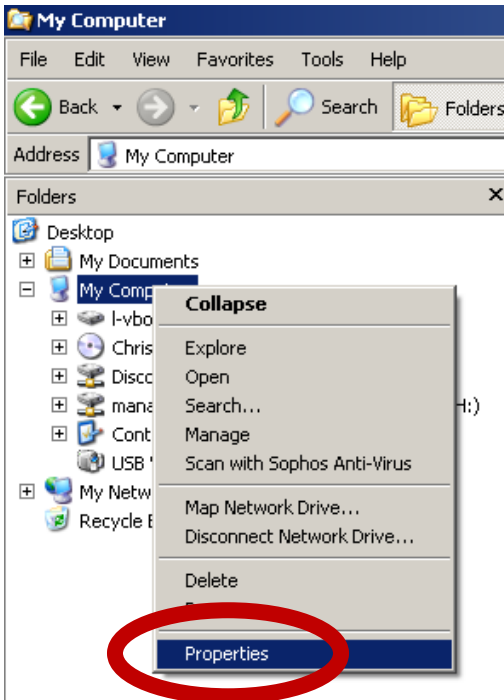
If your computer runs a version of Windows you can find this out easily by right clicking the 'My Computer' or 'Computer' icon (your version may differ from the examples shown), selecting Properties and looking at the information on the General System Properties tab.

To find out the size of the hard drive, expand the My Computer icon, then right click the drive letter and select properties again.
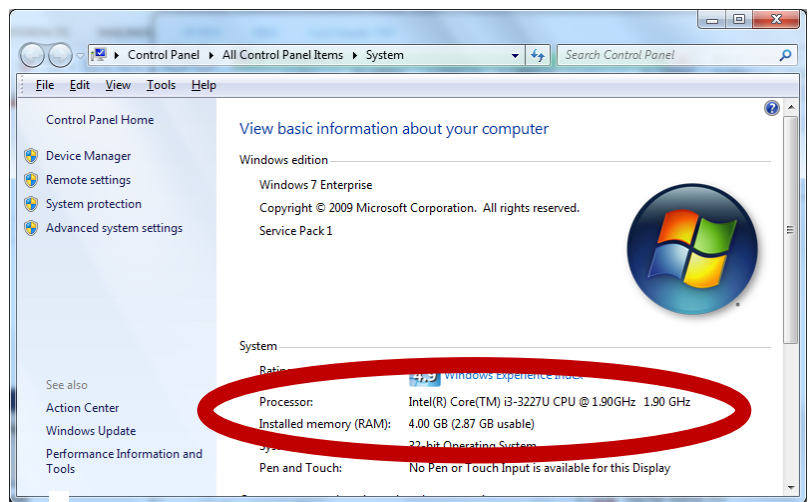
Finally for a bit of relaxation visit the supporting website here:

http://www.rigb.org/christmaslectures08/

Select the link to Breaking The Speed Limit and have a go at the two games.

Can you unlock the component?