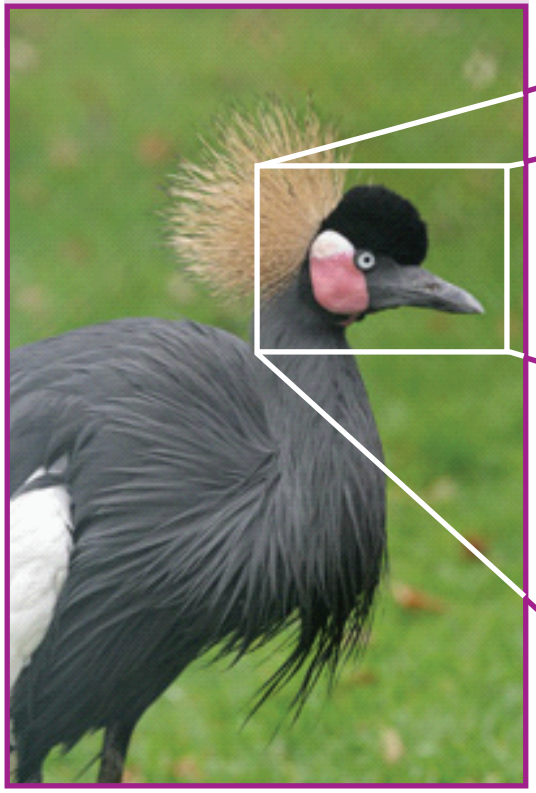
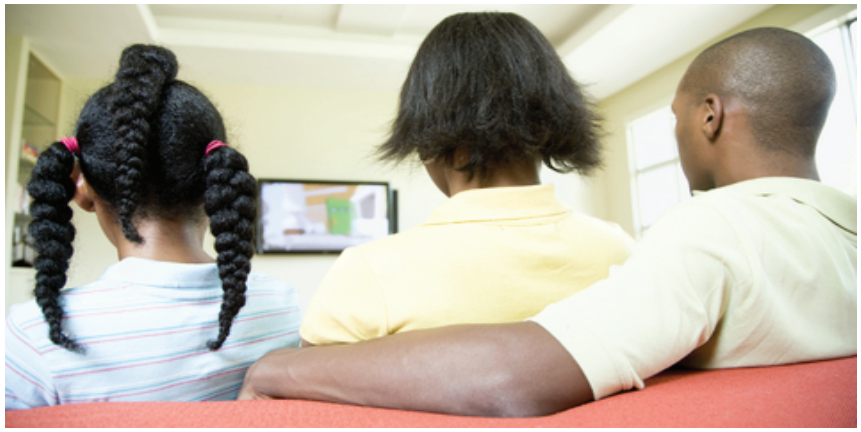
This picture is made up of **60,000 pixels**.

At this size, it looks **pretty good**!





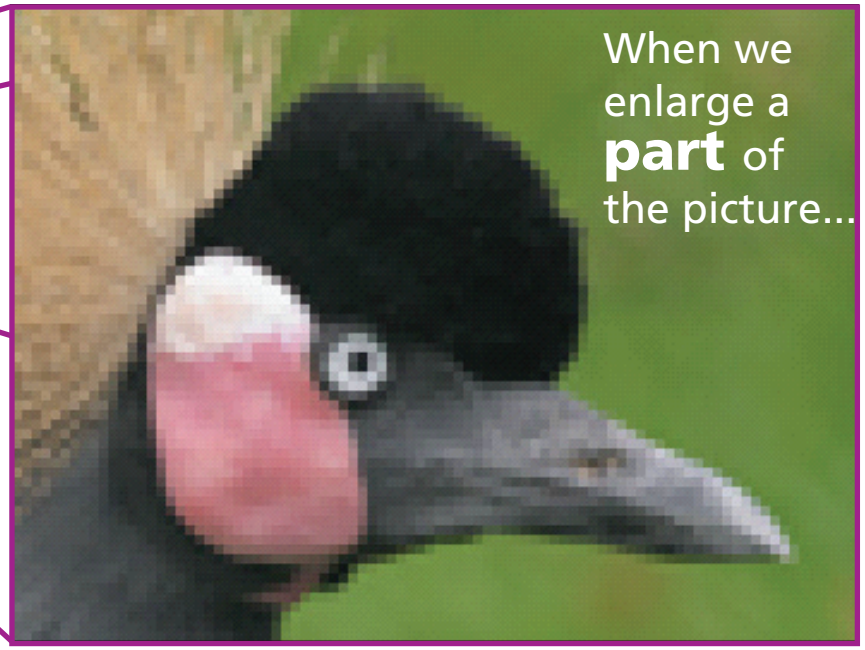


Photo by Peter Smith Associates 2008

...you see the individual pixels.

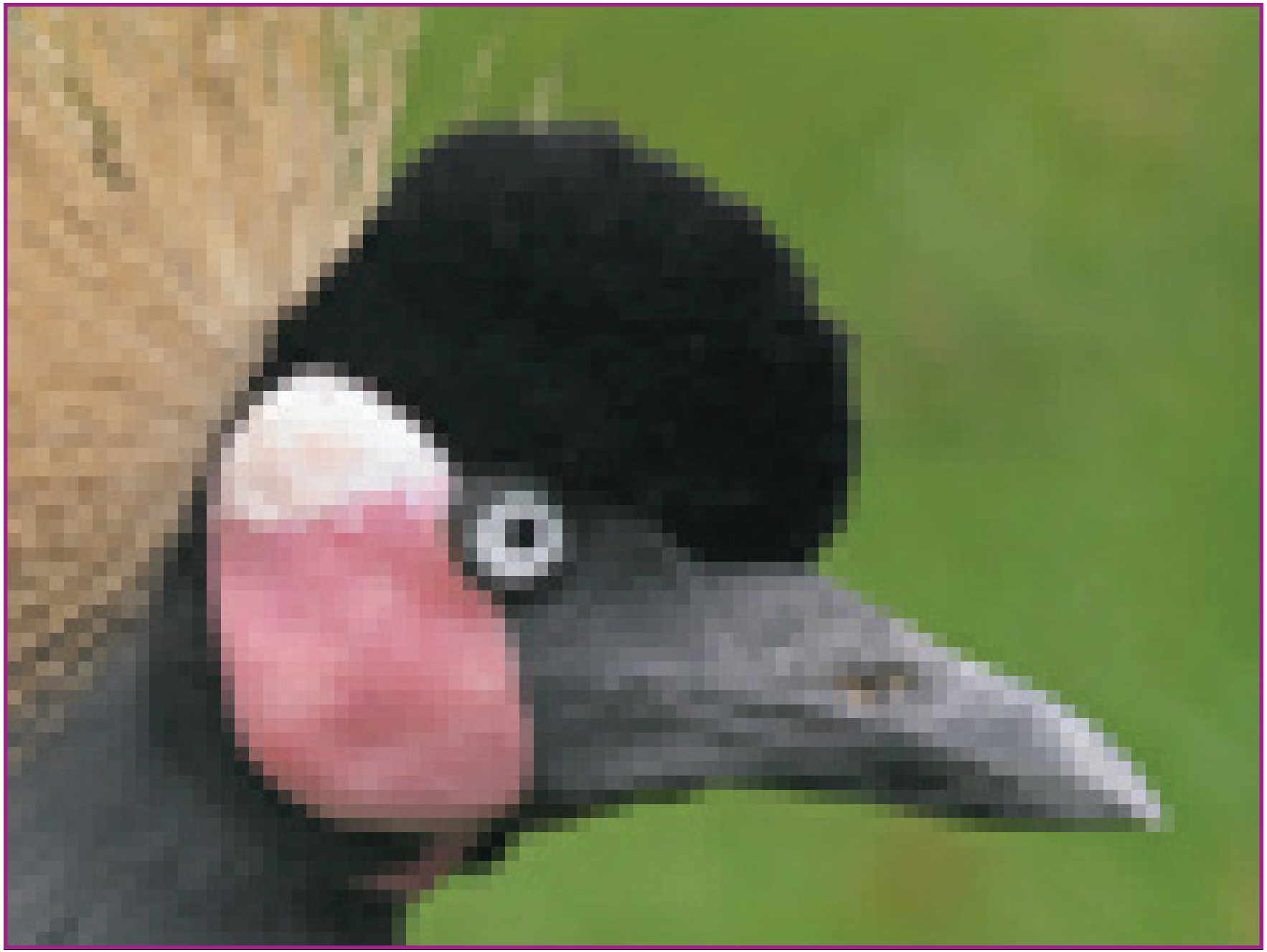
This effect is called **pixilation**.

Hold the picture up and move away from it.

When you get far enough away the pixilation seems to disappear!

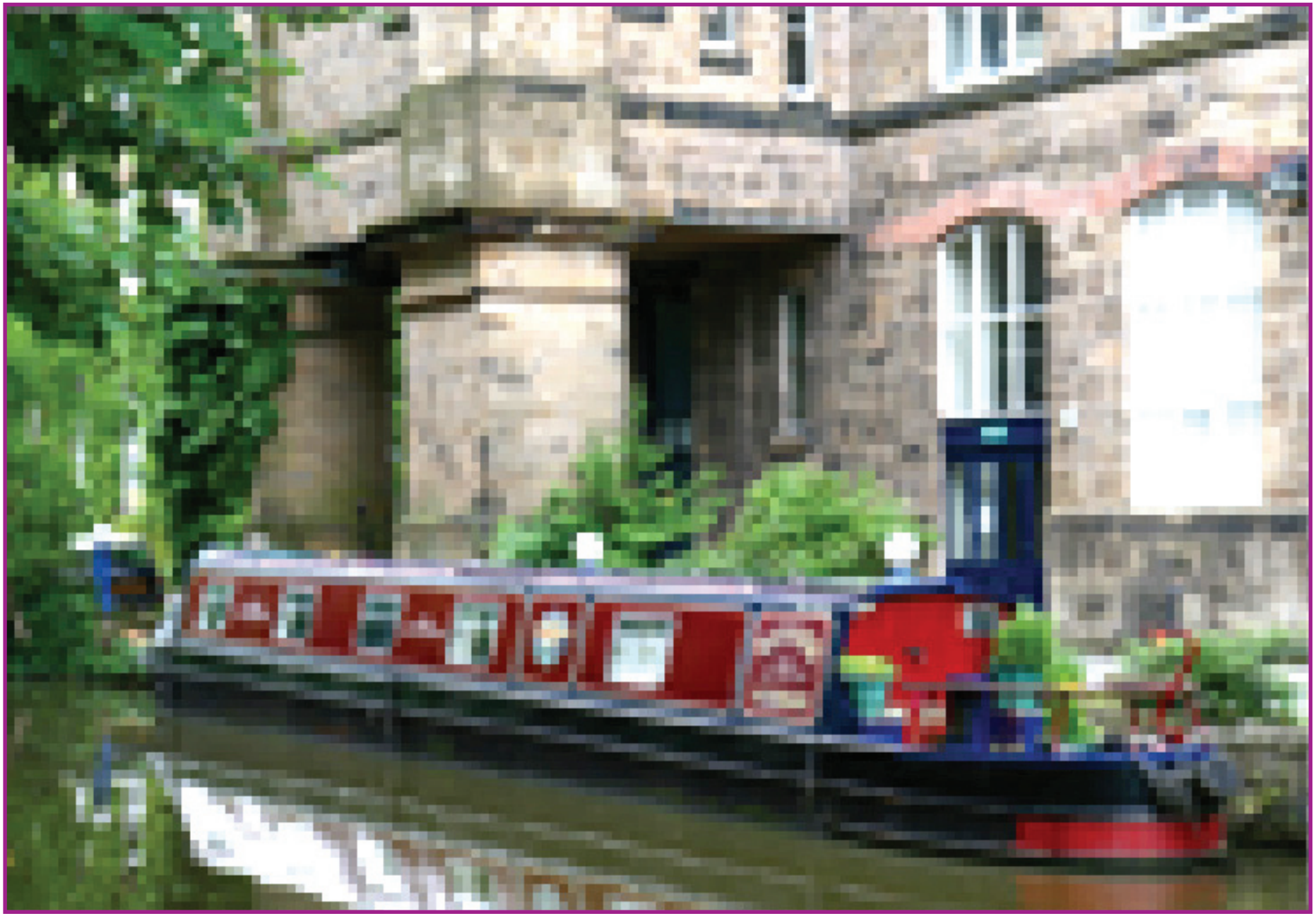
Getting a good television picture depends both on the **number of pixels on the screen** and the **distance you are from the screen**.

How far do you need to move from each of the pictures before the ***pixilation disappears***?



Photos by Peter Smith Associates 2008

Photos by Peter Smith Associates 2008



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create maths

digital design

Teacher notes

Digital design : Pixel perfection

Description

This topic investigates the 'best' size for a television. If you have a large flat screen and view a standard analogue or digital picture the individual pixels are visible if you are sitting too close to the screen. Unless you are *only* viewing programmes transmitted in 'High Definition' you could be better off with a smaller TV screen where you are not distracted by being able to see the individual pixels.

Activity 1: How big should your TV be?

Resources

Long tape measures.

How big should your TV be? involves pupils working in small groups of 3 or 4 to measure the 'pixel density' of a selection of pictures and to find out at what distance from the eye the pixilation disappears. They then decide on a method of comparing these two measures for their pictures.

Motivate the activity with a short whole class discussion about the size of TV screens and the quality of the picture. Give each small group the selection of ten pictures provided in **How big should your TV be?** pictures to consider. Begin the activity by displaying one or more of the pictures and asking the class if they can still see the pixels. Establish that the pixel density and the distance from the eye when the pixilation disappears are both significant. Your pupils will need to record both these measures for each of the pictures.

The pixel size on the pictures provided varies. One measure of pixel density is the length in centimetres of 10 pixels.

Organise the groups so that each member of the group adjusts their distance from each picture until the individual pixels are no longer visible whilst the others take the measurements. It is likely that this distance will be different for each person so they will need to find a way to decide on a distance to represent the group. They could, for example, find the mean or the median distance for the group.

They will need to think of a way to make a comparison of this distance with the different pixel densities of the pictures. For example, they might draw a graph of the average distance against the pixel density. Challenge your pupils to think about the reasons for any anomalies in their results. For example, there could be errors in both their small and large distance measurements.

Encourage the groups to reach an answer to the question **How big should your TV be?** and agree on their justification for it before inviting them to present their findings to the whole group.

The mathematics

How big should your TV be? involves measuring both small and large distances, working out averages and plotting graphs.