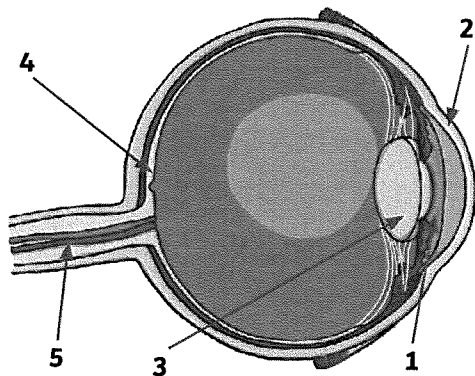
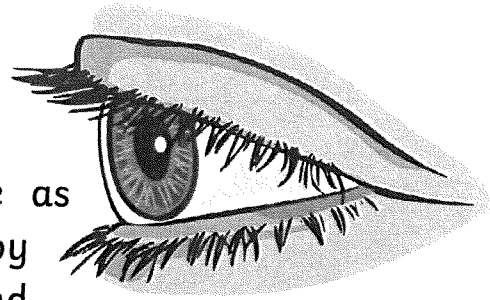


Our Senses - Sight

Scientists believe that the eye is the second most complex organ in the human body after the brain. Not bad for something that weighs as little as 27 grams. Our eyes allow us to enjoy sunsets, thunderstorms, birthdays and cup finals. Our eyes work by allowing light to enter through the pupil and hit the retina at the back of the eye. This is a bit like a film projecting onto a screen at the cinema. The eye is made up of a number of different parts.



The Eye

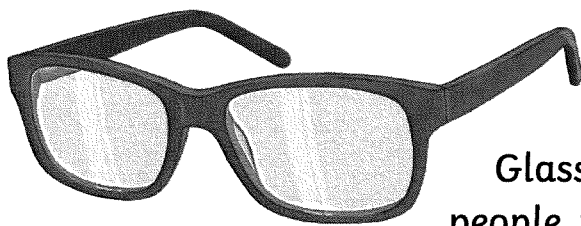
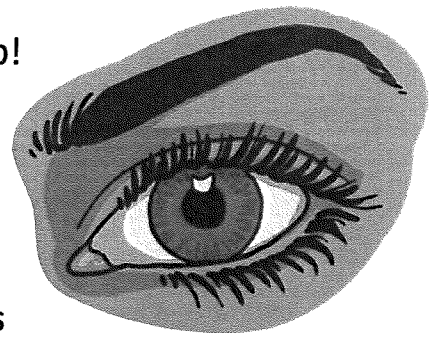
1. **Iris** - coloured part of the eye which controls the size of the pupil.
2. **Cornea** - controls and refracts the light onto the retina.
3. **Lens** - focuses the light arriving through the pupil.
4. **Retina** - the area sensitive to light and images.
5. **Optic Nerve** - carries messages from the eye to the brain.

The pupil allows light to enter the eye. It can grow and shrink to allow in the maximum amount of light possible. If it is dark, the pupil is forced to open wide to allow the maximum amount of light possible in. The lens allows the eye to focus, whether we are looking at an object that is very close to us, or a great distance away. The lens ensures that we see a clear image, not a blurry one. The retina takes all of this information and sends it down the optic nerve to brain. Strangely, the information is sent upside down!

Brilliant Fact

In your lifetime, your eyes will have seen more than 24 million different images!

The brain has to turn it the right way up!
Our eyes are phenomenal: they are able to see thousands of colours, see depth and speed with no problems. We have sent men to the moon, saved lives and discovered cures to diseases, but scientists aren't even close to producing a camera as powerful as the human eye!

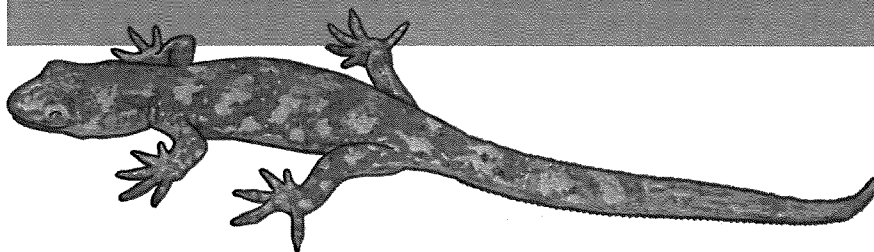


Modern science now means that even those who struggle with their eyes can be helped.

Glasses and contact lenses can help people who find it hard to focus, and laser surgery can permanently fix some problems. In some extreme cases, people are given cornea transplants. There are even experiments taking place with shark's eyes. Soon, science may make blindness a thing of the past!

The animal kingdom has some equally impressive eyes:

- An owl can see a mouse moving more than 50 metres away.
- A box jellyfish has 24 eyes!
- A dragonfly has 30,000 lenses in its eyes to help it spot predators.
- Geckos can see colours around 350 times better than humans.



Our Senses - Sight Questions

1. Which part of the eye carries messages directly to the brain?

2. How many lenses does a dragonfly have in its eyes?

3. Which organ is more complex than the human eye?

4. What is unusual about the image that our eyes see?

5. Why should mice stay a long way from owls?

6. Which animal has corneas very similar to a human ones?

7. In your lifetime, how many images will you have seen?

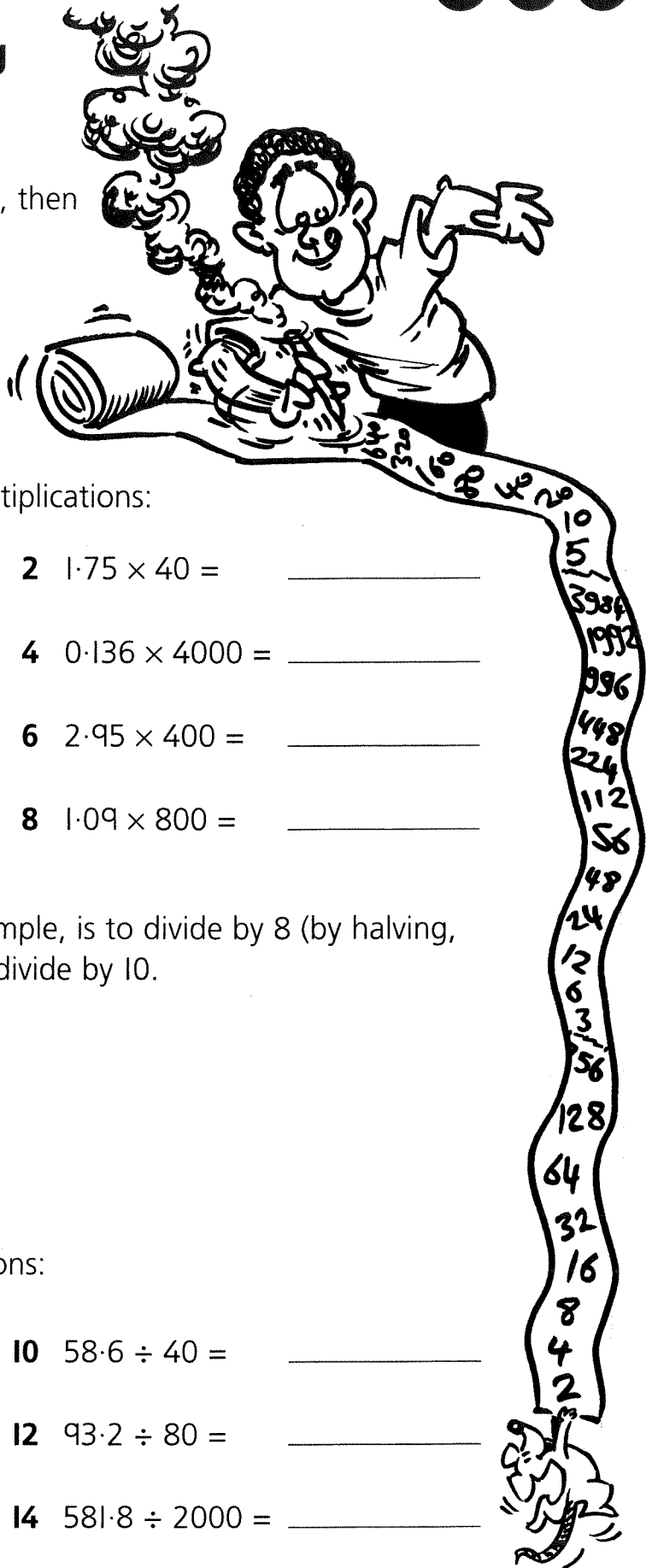
8. Which of your senses do you think is most important? Why?

Name _____

Fast multiplying and dividing

A fast method of multiplying by 400, for example, is to multiply by 4 (by doubling, then doubling again), then multiply by 100.

For example, 5.6×400
 double $5.6 = 11.2$
 double $11.2 = 22.4$
 $22.4 \times 100 = 2240$



Use doubling to help you with these multiplications:

- | | | | |
|---|-----------------------------|---|-----------------------------|
| 1 | $0.81 \times 20 =$ _____ | 2 | $1.75 \times 40 =$ _____ |
| 3 | $15.6 \times 200 =$ _____ | 4 | $0.136 \times 4000 =$ _____ |
| 5 | $4.32 \times 80 =$ _____ | 6 | $2.95 \times 400 =$ _____ |
| 7 | $0.076 \times 2000 =$ _____ | 8 | $1.09 \times 800 =$ _____ |

A fast method of dividing by 80, for example, is to divide by 8 (by halving, halving again, then halving again), then divide by 10.

For example, $5.44 \div 80$
 half of $5.44 = 2.72$
 half of $2.72 = 1.36$
 half of $1.36 = 0.68$
 $0.68 \div 10 = 0.068$

Use halving to help you with these divisions:

- | | | | |
|----|--------------------------|----|---------------------------|
| 9 | $7.82 \div 20 =$ _____ | 10 | $58.6 \div 40 =$ _____ |
| 11 | $9320 \div 400 =$ _____ | 12 | $93.2 \div 80 =$ _____ |
| 13 | $196.4 \div 200 =$ _____ | 14 | $581.8 \div 2000 =$ _____ |
| 15 | $636 \div 800 =$ _____ | 16 | $4656 \div 4000 =$ _____ |

Function machines

Sheet 1

2.75		
0.9		
$\times 10$		
174		

74.5		
0.02		
$\times 100$		
258		

4.5		
78		
$\div 10$		
0.04		

70		
48		
$\div 100$		
0.09		

Function machines

Sheet 2

0.478	$\times 100$	○
1.756		○
0.008		○

42.7	$\div 100$	○
5.8		○
0.5		○

0.457	$\times 1000$	○
2.634		○
0.006		○

8	$\div 1000$	○
5789		○
37		○