



# Dual coding

- <https://www.learningscientists.org/videos>
- Can you create a picture equation for each of the paper 1 Physics equations you need to learn?

Example:



$$\boxed{\text{work done}} = \boxed{\text{force}} \times \boxed{\text{distance}}$$



VISUALS



When you have the same information in two formats — words and visuals — it gives you two ways to remember the information later on.

Combining these visuals with words is an effective way to study.

Now make your own picture equation for each of these 11 paper 1 equations. If you are struggling for ideas of your own the noun generator website may be useful : <https://thenounproject.com/search/?q=energy>

1	P1	work done = force x distance	$W = F s$
2	P1	kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$	$E_k = \frac{1}{2} m v^2$
3	P1	gravitational potential energy = mass x gravity x height	$E_p = m g h$
4	P1	power = work done / time = energy / time	$P = W / t$
5	P1	efficiency = useful output / input	$\text{Eff} = \text{Out} / \text{In}$
6	P4	charge = current x time	$Q = I t$
7	P4	potential difference = current x resistance	$V = I R$
8	P5	power = potential difference x current	$P = V I$
9	P5	power = (current) <sup>2</sup> x resistance	$P = I^2 R$
10	P5	energy transferred = charge flow x potential difference	$E = Q V$
11	P6	density = mass / volume	$\rho = m / V$

# Dual coding biology

Now you know what dual coding is. Now create a revision poster for the Cells topic of Biology.

Here are some images you can use to help you with this topic

# B3

**Environmental**  
 Scar Tattoo Hair style  
 Caused by differences in conditions

**Genetic**  
 Eye colour Blood type Hair colour  
 Caused by differences in alleles that are inherited

**Mutation**  
 A mutation or genetic variant is created when the bases in a gene are changed.  
 Most have no effect.  
 Some slightly alter phenotype.  
 The bigger the change the larger the effect.



The male determines gender of baby as he has "Y" chromosome

X	X
X	XX
Y	XY

50% male  
 50% female

Female: XX  
 Male: XY

**Sex Determination**  
 Sex of humans is determined by the pair of sex chromosomes

Mum has brown hair (Bb) B: dominant  
 Dad has brown hair (bb) b: recessive

B	b
Bb	Bb
Bb	bb

75% of Both parents "carry" gene for hair colour  
 25% of



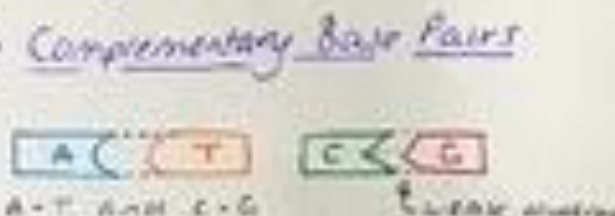
**Genetic Definitions**  
 Homozygous: both alleles are the same  
 Heterozygous: alleles are different

**Variation**  
 (differences)  
 Most variations are caused by recombination

**Collaboration**  
 between scientists to decode the human genome (base on chromosomes)

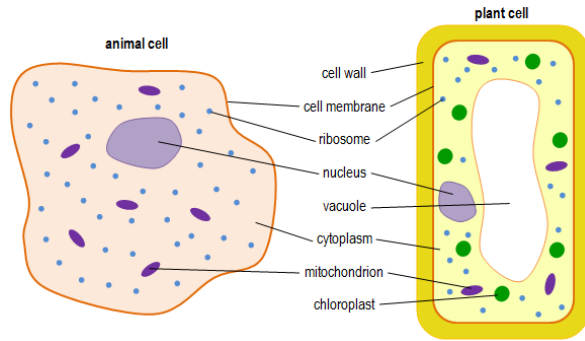
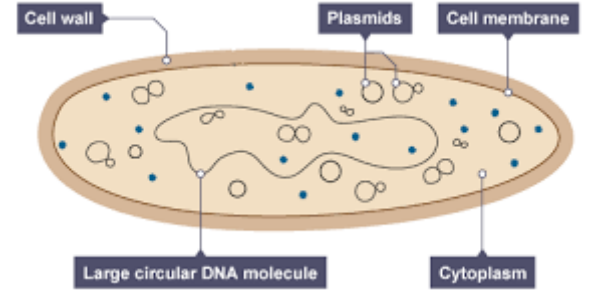
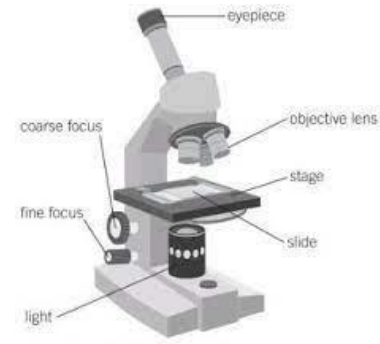
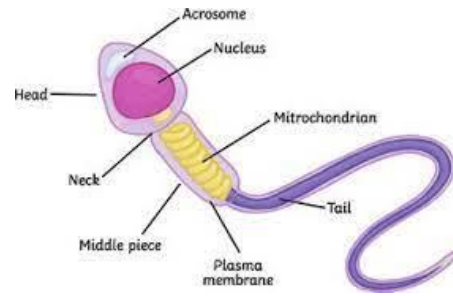
**Human Genome Project**  
 finished 2003

**Meiosis**  
 The parent cell divides in 2 and then in 2 again to form 4 non-identical daughter cells produced.





# Biology Cells



## DIFFUSION

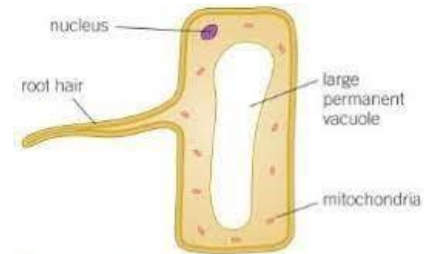
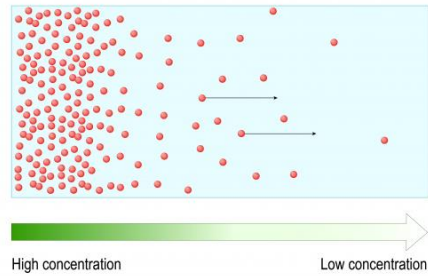
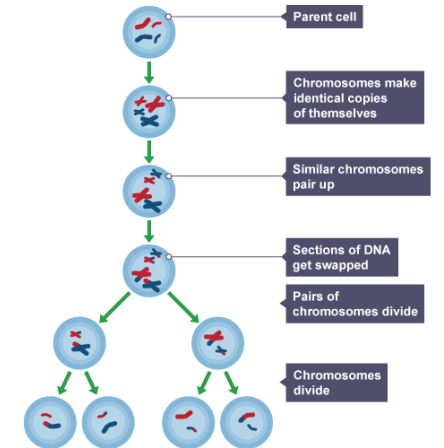
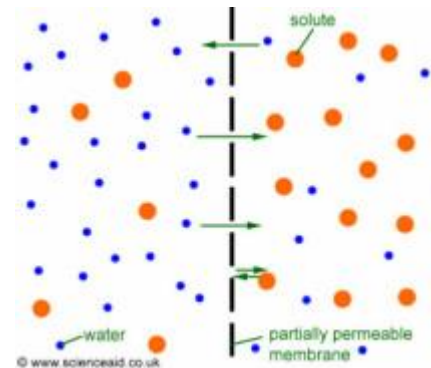
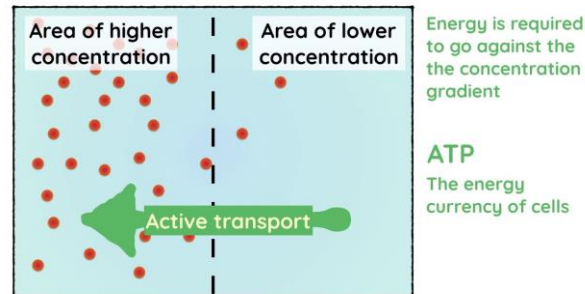
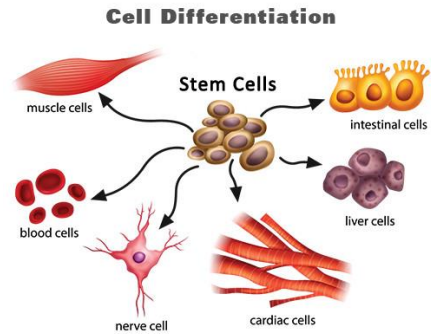
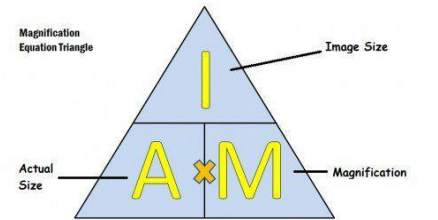


Figure 1 A root hair cell



# Dual coding Chemistry

Now create a revision poster for the Atomic structure topic of Chemistry.

Here are some images you can use to help you with this topic

