

EASTER BUSH SCIENCE OUTREACH CENTRE

Get hands-on
with real-life
science

Alien Babies Researcher Guidance

Learning level Primary: P5-7; Secondary: S1-4

Research themes Inheritance

Duration 20-50min (adaptable)

Alien Babies overview:

Participants will learn about single gene inheritance by determining the alleles inherited by an alien baby. Individuals are given a table which either shows the dominant and recessive alleles of the parent aliens (secondary), or pictures of the characteristics (primary). They will then flip a coin to reveal which allele/characteristic the baby has inherited. Once they have all the baby's characteristics the alien baby can be made from the spare part boxes. **This activity can and should be adapted to your own research and themes – get creative!**

Learning objectives

P5-P7

- To understand that DNA is a recipe for life
- To recognise that scientists can use DNA to answer scientific questions
- To understand that characteristics are inherited from both mother and father

S1-4

- To understand that DNA is present in the nucleus of nearly every cell and is structured into 23 chromosomes.
- To recognise that genes are present as two alleles on each pair of chromosomes and are inherited.
- To understand that some alleles are dominant and some are recessive

Before the activity:

- Familiarise yourself with the activity protocol.
- Come up with some information about yourself and your research that can be linked to the exercise
- Complete the attached template risk assessment and send to the school, the Health & Safety team (ros48@exseed.ed.ac.uk) and the EBSOC team (eb soc@ed.ac.uk).

Activity protocol

Exercise	Description	Timing
Introduction	<p>Introduce the class to concepts surrounding what DNA is and where it can be found in the cell. Explain that DNA is a part of (nearly) all living things.</p> <p>Explain the relationship between genes, alleles and chromosomes, emphasising that one chromosome from each pair is inherited from the biological mother and father. For secondary classes this can be expanded to the idea of dominant and recessive alleles.</p> <p>Use these concepts to explain genetic inheritance of traits.</p>	10-15min
Activity	<p>Ask pupils to get into pairs. Give each pair a worksheet and a coin. Talk through the activity protocol, then walk among the pairs and help any who get stuck.</p> <p>Once each pair has gone through the worksheet, they can come and collect a glue stick and the parts needed for their alien baby. (Glue sticks may need to be shared between multiple pairs). If there are not enough parts, either the demonstrator, teacher or students can cut new ones from the spare part sheets.</p>	10-20min
Wrap up	<p>Explain that DNA is very important in research and has a wide range of uses. Use examples from your own research if you can, or some that you have thought up, to explain what kind of research is done into DNA.</p> <p>Take any questions the class might have and ask pupils to return unused equipment.</p>	5-10min

The timings above are a guide only – you can adapt these to the time available, or learning level of pupils you are working with.

Alien Babies activity protocol

Primary:

1. Each pair should have a primary worksheet and a coin.
2. Students should flip a coin for each characteristic and circle whichever option they get.
3. Once all characteristics have been decided the pair can collect a glue stick, body card and body parts to make their baby.

Secondary:

1. Get each pair of students to take a coin and the first sheet for this activity.
2. On this sheet, we have the genes for Zacron and Kharlan. First work through the white columns. Flip a coin. If it is heads, circle the heads. If it is tail, circle the tail.
3. Once you have worked through all of Zacron's result, do the same thing with Kharlan's genes.
4. Now transfer the circled result from the first side to the second side. Make sure you have transferred the BIG and small letters correctly.
5. Once you have done that, use the table next to it to work out what the baby will look like. Remember, any combination with a BIG letter means it will show the dominant feature. For example, BIG S and small s means the kid will have purple skin.
6. Once they have all the characteristics, students can collect a glue stick, body card and body parts to make their baby.

Notes:

- (Depends on time and age of students) Get the students to put their alien names on the front of the card (or their names on the back). Put all the aliens together somewhere + put mum and dad at the top. Ask them to point out anything they notice.
 - o Hopefully someone will point out that neither mum nor dad has yellow antenna or small mouth (see below)
 - o Hopefully someone will point out that no babies have yellow nose (see below)
 - o If the class is big enough, they might notice there are less babies with certain features.
 - o If anyone points out that the aliens have different sized eyes, it can be mentioned that – we don't know which gene is for eye size! And this is what researchers do, together with biologists, mathematicians, chemists, nurses, doctors.. etc, they look at features and all of genes for people and sometimes their parents, to find out which gene is responsible for the seen features.
- Raise your hand if your alien baby has yellow antenna. Notice that neither the mum nor dad have yellow antenna!
- Raise your hand if your alien baby has small mouth. Again, both mum and dad have big mouth.
- Don't raise your hand if you don't want to, but there was a trick designed here to catch people out. If you have a yellow nose, I'm sorry, you have made a mistake. If you look at Zacron's genes for nose, they are both BIG Ns, this means no matter what happens, the kid will always have red nose.