POPPY SCHOLARS · BIOLOGY: THE LIVING EARTH

Home lab 8 · Unit 8 · about 40 minutes

How many different gametes can one organism with 3 pairs of chromosomes make?

Name _____ Date _____

MATERIALS

You supply everything. Tick each item as you gather it.

- ☐ 3 coins (they can be different)
- ☐ Paper and pencil
- ☐ A calculator

SAFETY

No special safety concerns. Keep small coins away from young children.

PROCEDURE

1. Imagine an organism with 3 pairs of chromosomes. In each pair, one chromosome came from its mother (heads) and one from its father (tails).
2. A gamete receives one chromosome from each pair, chosen at random and independently. Flip the three coins at once to make one gamete. Write down the three results in order, for example HTH.
3. Make 64 gametes in this way. Tally how many times each of the eight possible combinations (HHH, HHT, HTH, HTT, THH, THT, TTH, TTT) appears.
4. Also tally the gametes by the number of heads (how many maternal chromosomes the gamete carries): 0, 1, 2 or 3.
5. Compute the expected counts if every combination is equally likely (64 divided by 8), and compare with what you got.

RECORD YOUR DATA

Combination	Observed	Expected
HHH		8
HHT		8
HTH		8
HTT		8
THH		8
THT		8
TTH		8
TTT		8

Number of maternal chromosomes	Observed	Expected
3 (HHH)		8
2		24
1		24
0 (TTT)		8

LAB REPORT

Write a report that gives both tables, explains why the expected counts are 8, 24, 24 and 8 in the second table, and says what your results show about variation among gametes from one parent. Calculate how many gamete types a human (23 pairs) could make from independent assortment alone, and say what that leaves out.

Report the numbers you actually got, even when they disagree with the lesson. Write on the lines, or type your report on the website and send it to a teacher there.

Question and hypothesis *State the question in your own words, what you expect to happen, and why you expect it.*

Method *What you changed, what you measured, what you kept the same, and how many trials you ran.*

Observations *Describe what you saw, including anything unexpected. Your data tables are added to the report automatically.*

Calculations *Show each calculation step by step, with units.*

Claim and reasoning *Answer the question using your numbers, then explain why, using the biology from the unit.*

Limits and next step *What could have affected your results, and one change you would make next time.*