

Next Generation Robots Worksheet

Complete one copy of this worksheet for each generation of robot.

Generation #: _____

Parent Traits:

Parent #1:

Glow:

Power:

Turn Direction:

Parent #2:

Glow:

Power:

Turn Direction:

Phenotype: _____

Results of Punnet Square:

Phenotype: _____

Results of Punnet Square:

Phenotype: _____

Results of Punnet Square:

Phenotype for your Sphero:

1. Complete the table below to document basic data about the first generation of robots in your classroom.

Generation of Robots: Number of robots in Sample: Number of robots in Class:		
Phenotype (expressed allele):	Number of Robots that Express this Trait	Percentage of Sample that Expresses this Trait
Green Glow		
Blue Glow		
High Power		
Low Power		
Right Turn		
Left Turn		

2. Which phenotypes are most heavily represented, and which phenotypes are the least represented in the population? What are the statistics to support this?

3. In four generations of robots, which phenotypes do you think will be strongly represented in the classroom's robots? Provide reasoning for your prediction.

4. Use the information from your Punnet squares to document which traits your Sphero will likely express. Make sure to note if your Sphero is heterozygous or homozygous for each trait.

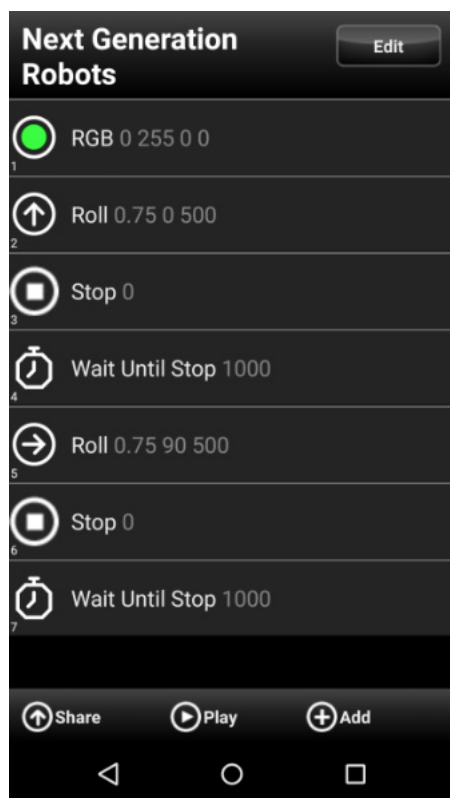


Glow:

Power:

Turn Direction:

5. Program your Sphero to express these three traits using this Macro as a template:



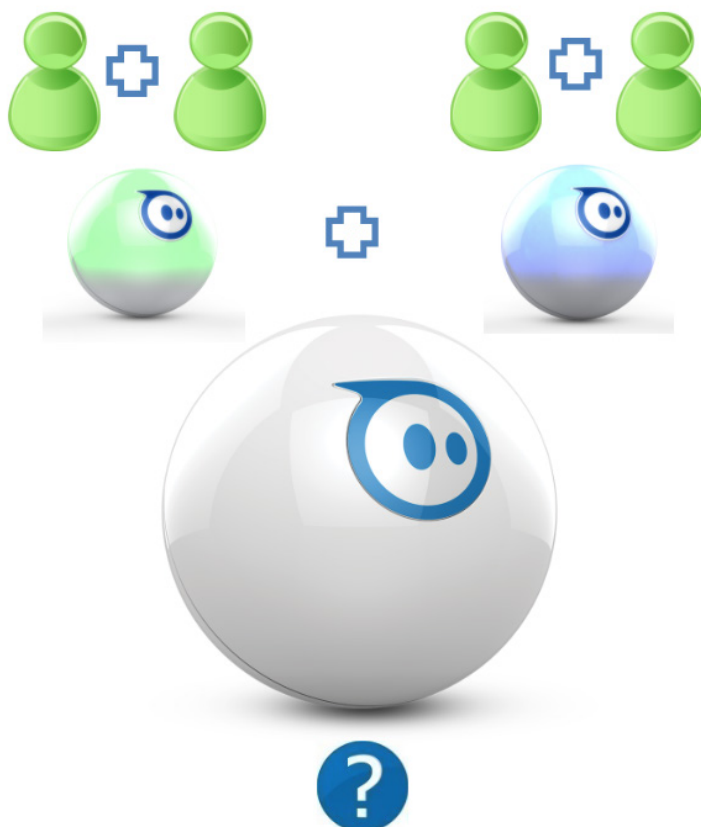
6. Introduce your Sphero to a Sphero that is a child of another group of parents.

After the first generation, all of the parents will be Sphero robots with different combinations of alleles.

Use another copy of the Phenotype Worksheet to document your Sphero as one of the parents and the new Sphero as the other parent.

Complete the same process to determine which alleles the next generation robot will inherit and which phenotypes will be expressed by the child Sphero.

Example:



7. After several generations of robots have been created, document the expressed traits within

Generation of Robots: Number of robots in Sample: Number of robots in Class:		
Trait:	Number of Robots that Express this Trait:	Percentage of Sample that Expresses this Trait:
Green Glow		
Blue Glow		
High Power		
Low Power		
Right Turn Direction		
Left Turn Direction		

8. How do these statistics compare with the first generation of robots and to the prediction you made?

3. In four generations of robots, which phenotypes do you think will be strongly represented in the classroom's robots? Provide reasoning for your prediction.

4. Use the information from your Punnet squares to document which traits your Sphero will likely express. Make sure to note if your Sphero is heterozygous or homozygous for each trait.



Glow:

Power:

Turn Direction:

Sample Program



Overview:

This basic Macro will move the Sphero in a straight line, from one point to another, along a flat smooth surface. It rolls Sphero at a predetermined speed and heading that determine the direction and length of time the robot will move.

The distance that Sphero rolls is determined by a combination of speed and time. It has been created to overshoot the required distance so that students may experiment with the variables in the program and calculate percent error throughout their trials.

