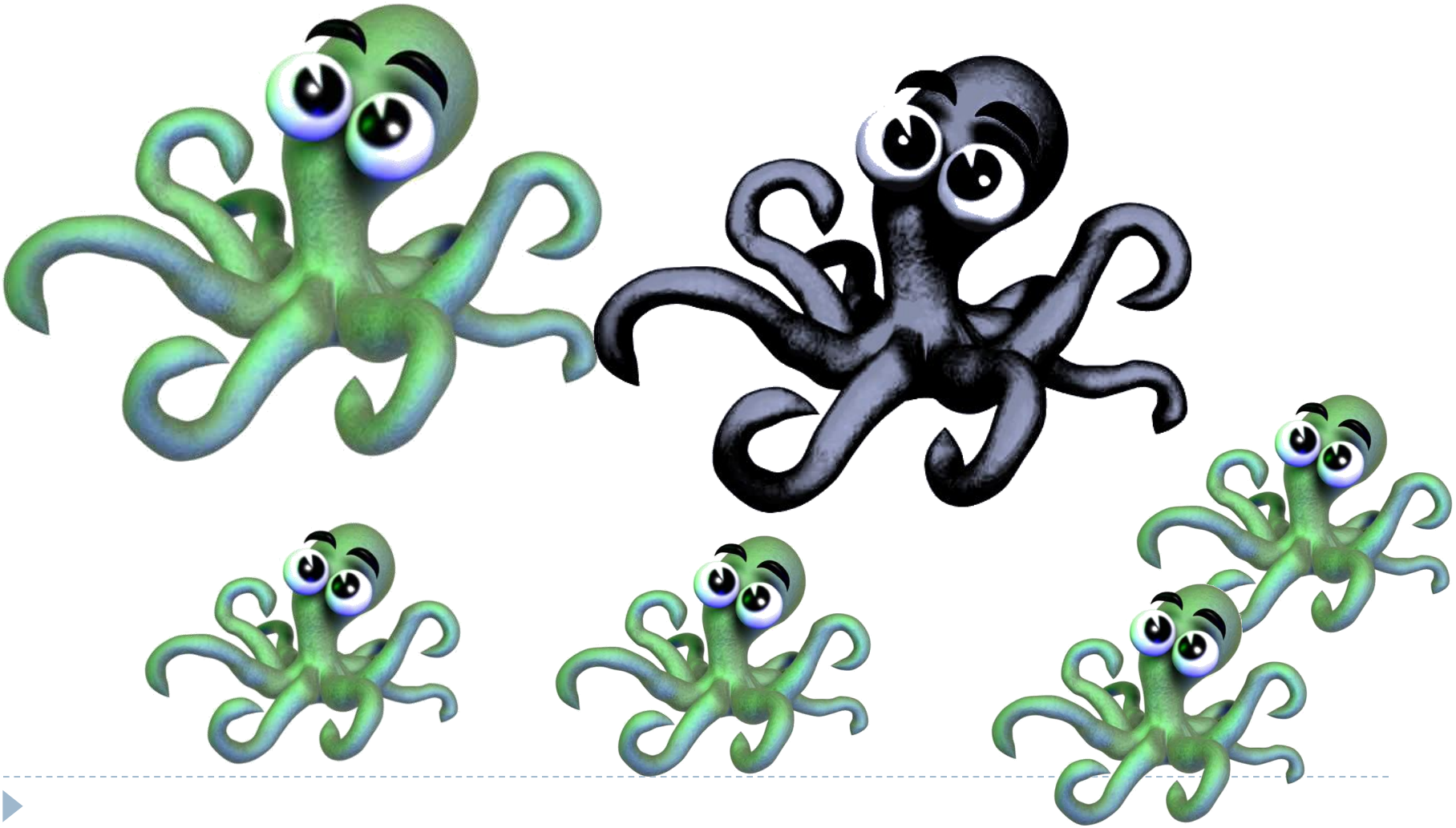
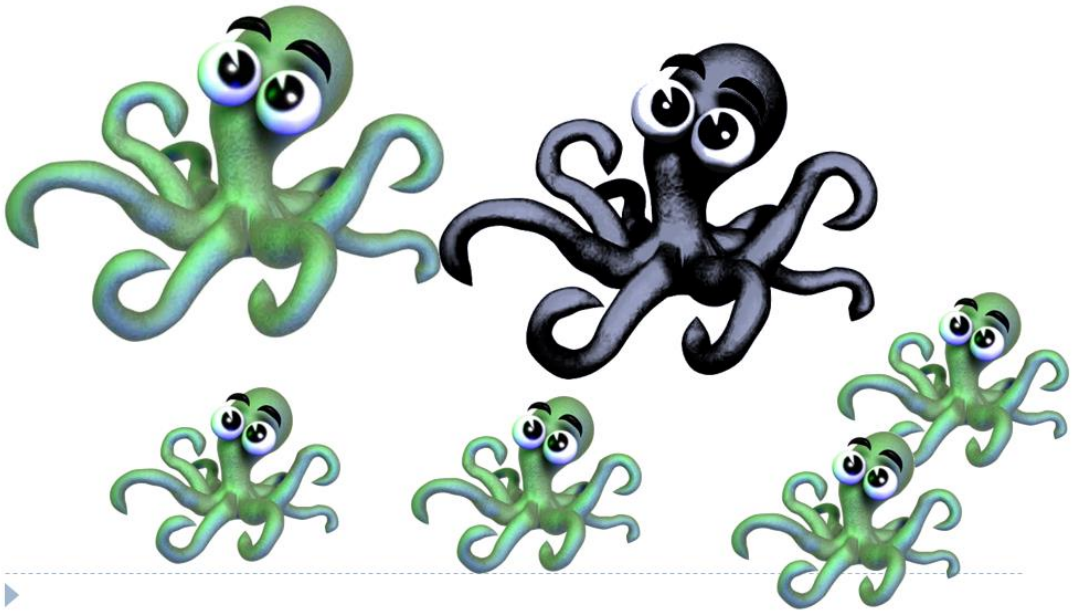
How would you create a Punnett Square for this family?



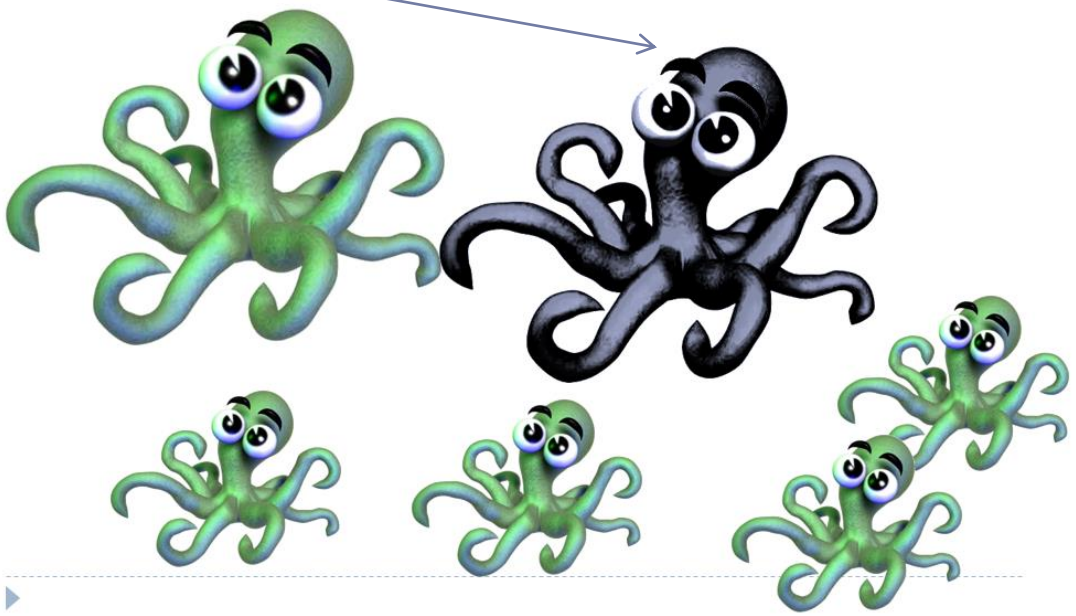
5 Steps of Punnett Square Problems

- Step 1: Figure out what is recessive.
  - Usually the trait that is dominant is more common.
  - Usually the trait that is recessive is less common.
  - In this case, we can tell that black/purple is recessive and green is dominant.



5 Steps of Punnett Square Problems

- Step 2: Determine the genotypes of the parents
  - One is pretty simple – the purple recessive parent has to have two little letters: aa
  - The other green parent has only two possibilities – AA or Aa
  - So we know that one parent is aa and the other is either Aa or AA.

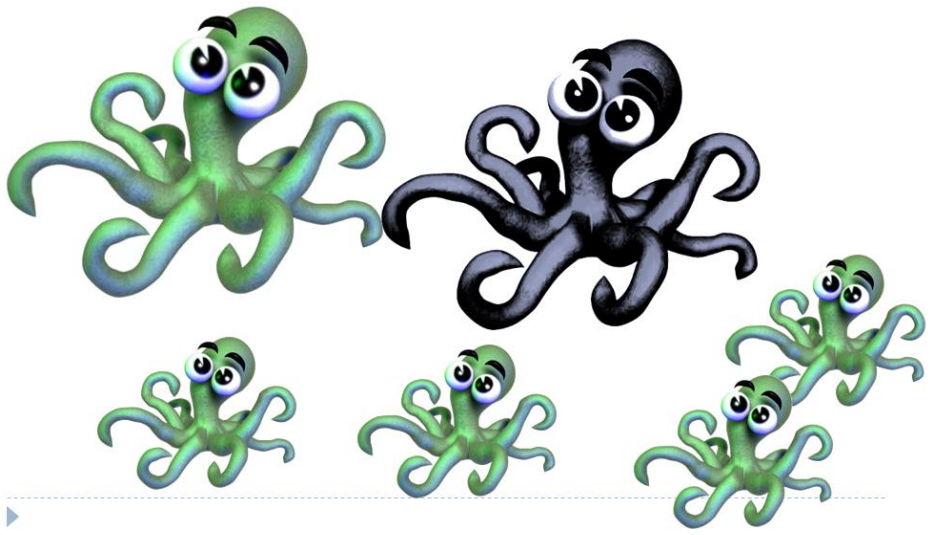


5 Steps of Punnett Square Problems

- Step 3: Create the Punnett Squares for each possibility.
- Step 4: Select the Punnett Square that reflects what we see for offspring below.

	A	a
a	Aa	aa
a	Aa	aa

	A	A
a	Aa	Aa
a	Aa	Aa



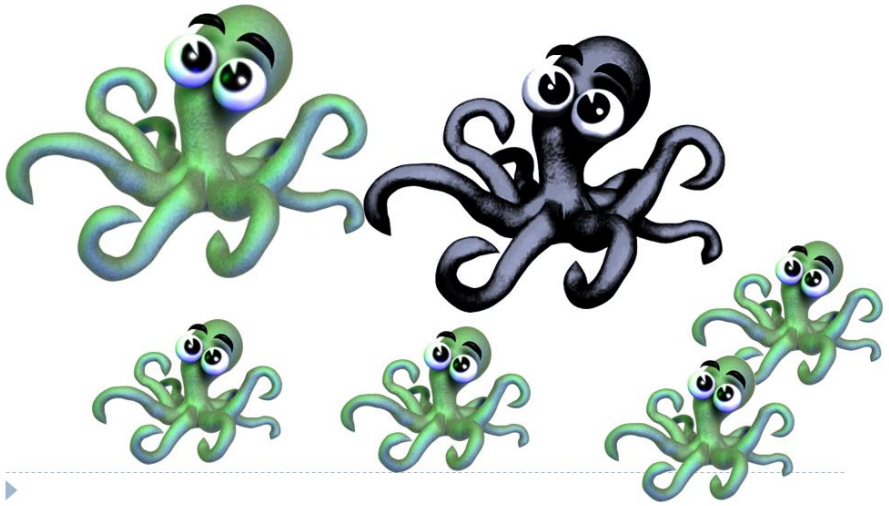
5 Steps of Punnett Square Problems

- Step 5: Confirm that you are correct.

	A	a
a	Aa	aa
a	Aa	aa

You know that the Punnett Square on the left cannot be correct because ½ the offspring are recessive.

	A	A
a	Aa	Aa
a	Aa	Aa



How would you create a Punnett Square for this family?

Step 1: Figure out what is recessive

- Usually the recessive trait is the less-prevalent trait (not always, but usually).
  - In this case we know both green and purple are equally common, but we know from before that green was dominant.

Step 2: Determine the genotypes of the parents

- We know that the purple parent has to be aa
- We know the green parent could either be AA or Aa

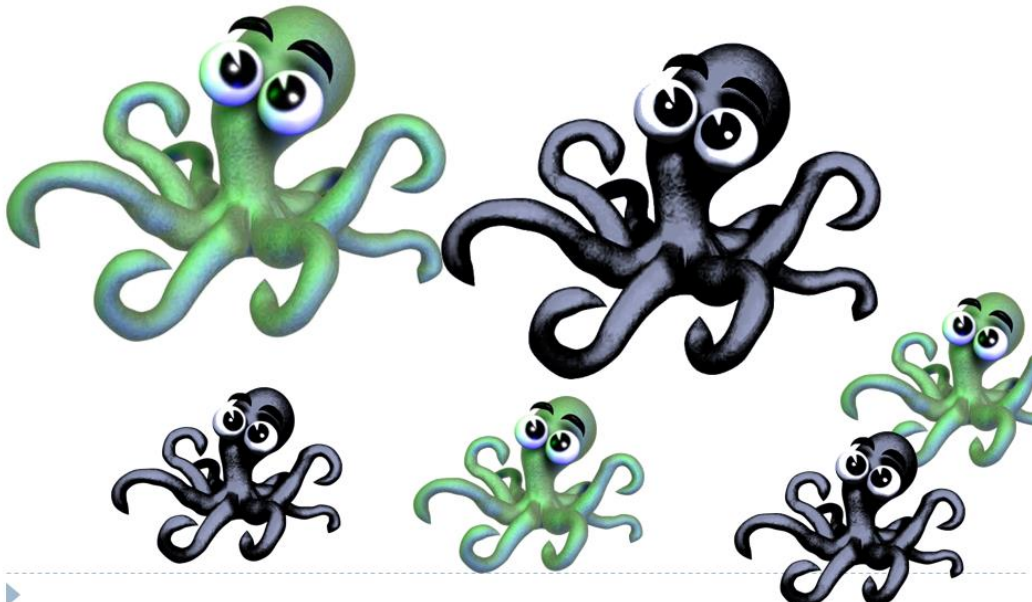
Step 3 & 4: Create Punnett Squares for each possibility; pick the correct square

- Create Punnett Squares for all parent genotype combo possibilities

	A	a
a	Aa	aa
a	Aa	aa

You know that the Punnett Square on the left is correct because half are the dominant phenotype and half are the recessive phenotype.

	A	A
a	Aa	Aa
a	Aa	Aa



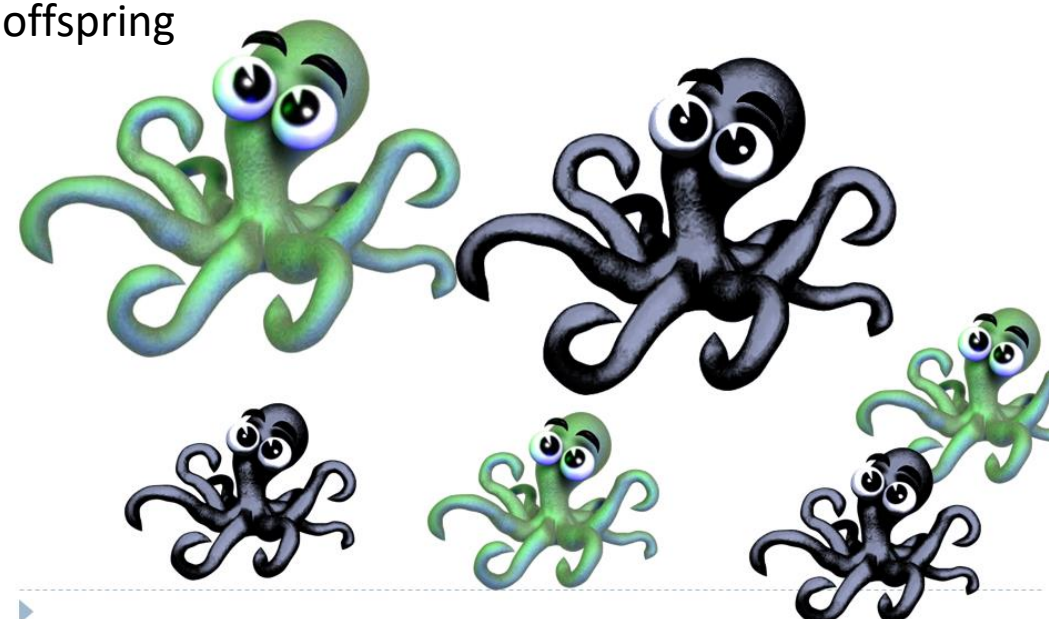
Step 5: Confirm that you are correct.

- Be prepared to explain why the other Punnett Square would not work.

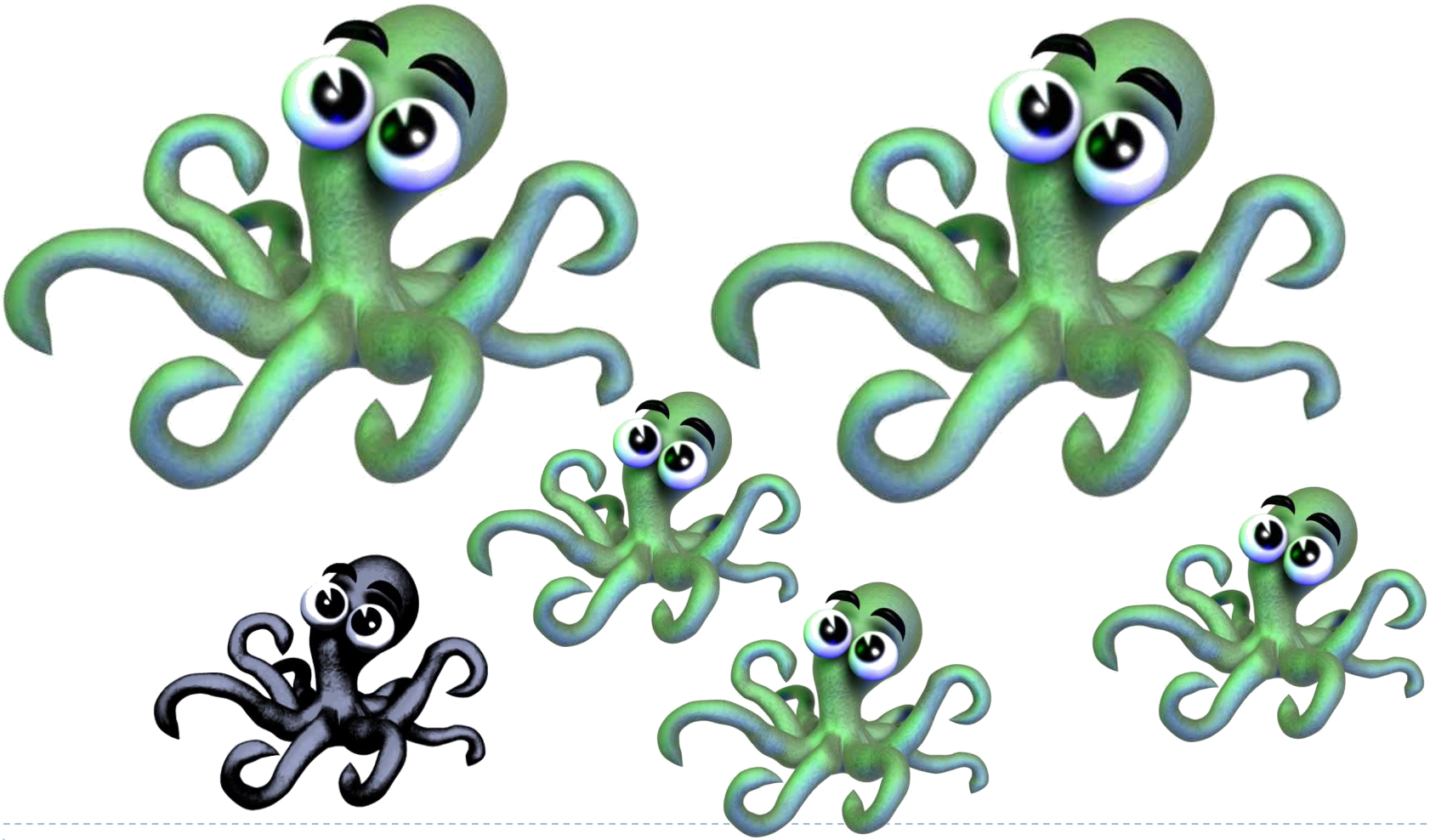
	A	a
a	Aa	aa
a	Aa	aa

You know that the Punnett Square on the left is correct because half are the dominant phenotype and half are the recessive phenotype. The other has only green offspring

	A	A
a	Aa	Aa
a	Aa	Aa



Personal Test: How would you create a Punnett Square for this family?



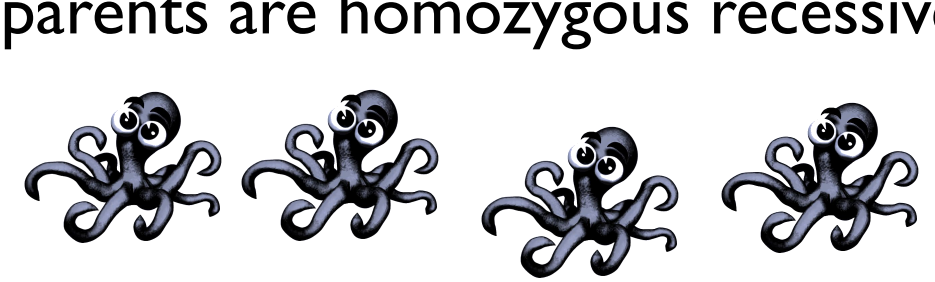
Possible Combinations

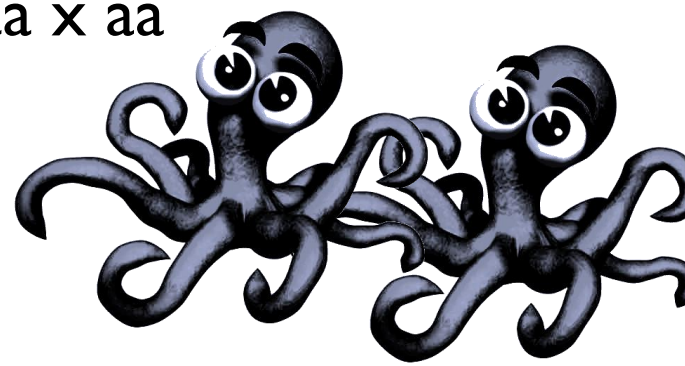
- With simple traits, there are only six possible combinations of parents
  - AA x AA
  - AA x Aa
  - Aa x Aa
  - AA x aa
  - Aa x aa
  - aa x aa

- Each one will have the same results for offspring ratios each time.

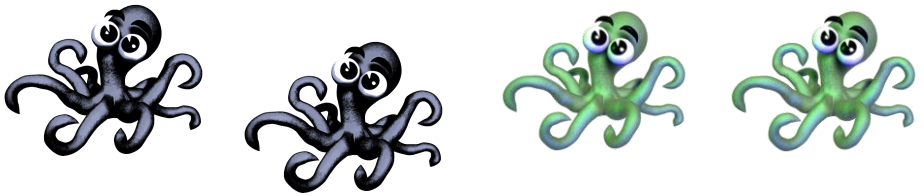
Offspring Ratios

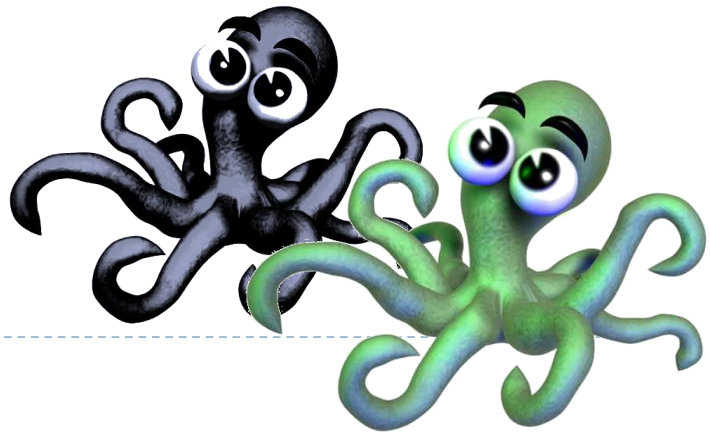
- If we have only recessive phenotypes, we know that both parents are homozygous recessive – aa x aa





- If we have half recessive, half dominant phenotypes, we know that one parent is Heterozygous and one parent is Homozygous Recessive – Aa and aa





Offspring Ratios

- If we have ¼ recessive and ¾ dominant phenotypes, we know that both parents are Heterozygous – Aa and Aa

- If all offspring are the dominant phenotype, we know that the combination of parents must be one of the following:
  - AA x AA Aa x AA AA x aa
  - Additional combinations would be necessary to determine which it is (except in the last example, where one parent has the recessive phenotype).