Today is a very exciting day on the Isle of Gandwar. Two of the dragons there are about to have a baby. Because this happens only about every 500 years, the birth of a dragon is met with great anticipation. The lucky parents are Molthwan and Lucenne, two of the island's most admired inhabitants.

Like all eager parents, Molthwan and Lucenne are anxious to know what their baby will be like. Molthwan is especially interested in knowing whether the baby will have wings and be able to fly. Lucenne is hoping that the baby will be able to breathe fire, something not many dragons on Gandwar are able to do.
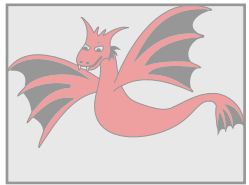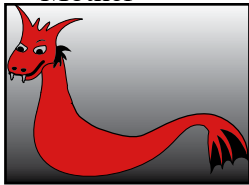

Fortunately for the happy couple, dragons on Gandwar have kept meticulous records about dragon births and biology since shortly after the Redawning.
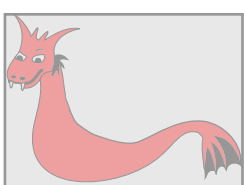
Try some pairings of dragons from the record book to see what types of couples have had babies with wings:

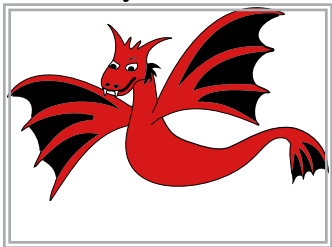Mother

Father

Baby

Fire-breathing dragons are less common on Gandwar. Try some pairings of dragons from the record book to see what types of couples have had babies that breathe fire:

Which of these traits is a dominant hereditary trait?

a. Wings

b. Fire-breathing

c. Both

d. Neither

Why?

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Female Dragon

Female Dragon

hh

Hh

HH

| Chromosome: 1 | h | Horns | Chromosome: 1 | h | Horns |

| Chromosome: 2 | w | Wings | | L | Legs | | t | Tails |

| Chromosome: X | f | Fire | | a | Color1 | | B | Color2 |

Chromosome: 1 — h — Horns (second, yellow)

Chromosome: 2 — w — Wings, L — Legs, t — Tails (second, yellow)

Chromosome: X — F — Fire, a — Color1, b — Color2 (second, yellow)

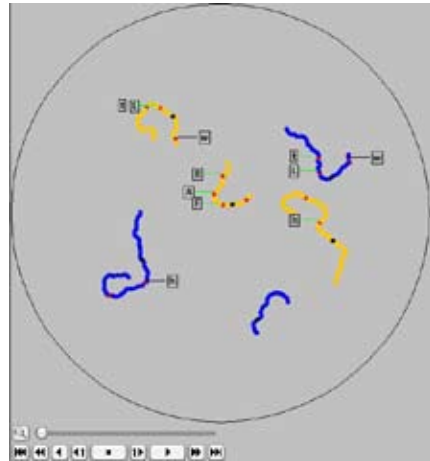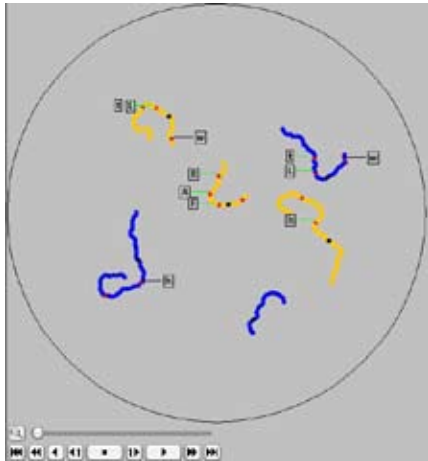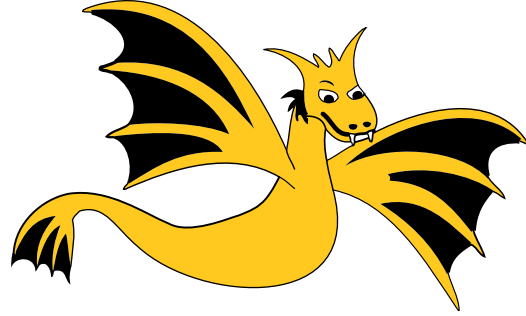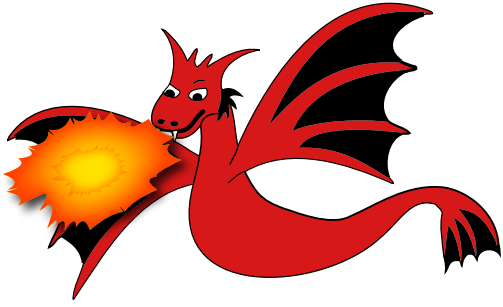You're now looking at a *chromosome view* of a dragon.

Click on a chromosome. **Good**

Click on a gene. **Good.**

Change the genes for wings and fire and see what happens.

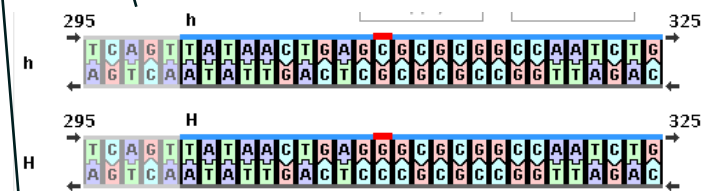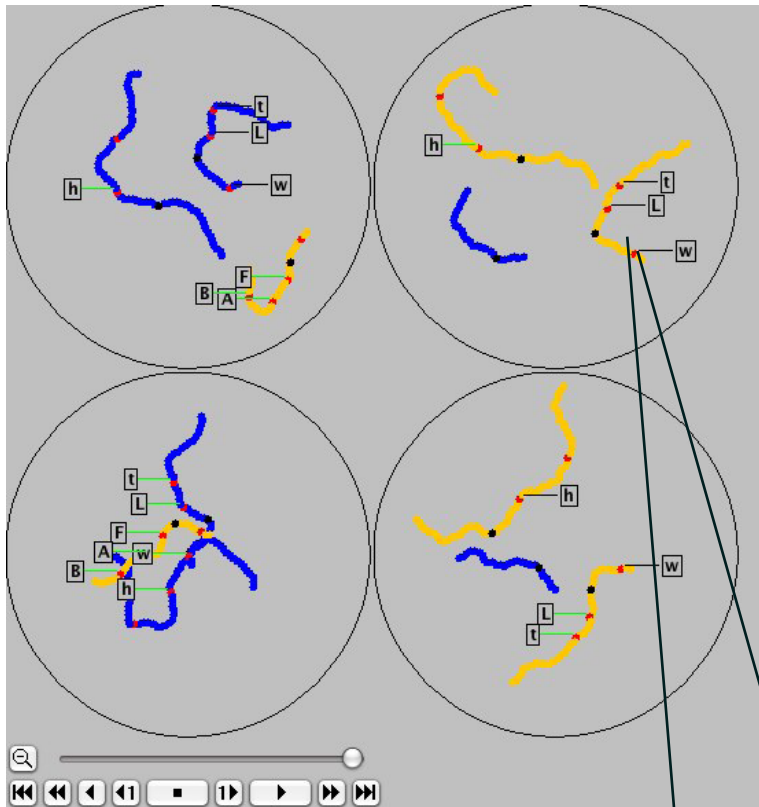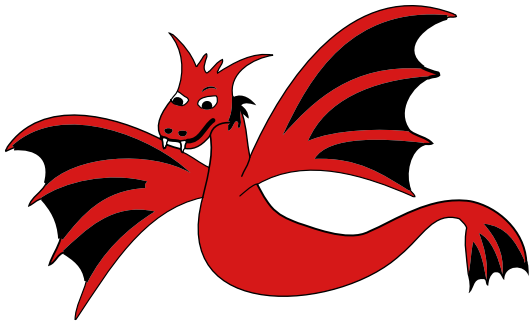What combinations of genes will create a dragon with wings?

What combinations of genes will create a dragon that breates fire?

The dragons reproduce through the process of meiosis. Click the buttons above to run through the stages of meiosis. As you do, notice what happens to the chromosomes. (Pauses during tetrad and doubling stages -- have student zoom in to observe doubled chromosomes. Do this as a "movie"?)

When chromosomes double in meiosis, are there differences in the copied chromosomes?

Look at the highlighted chromosome in the paused stage of meiosis in the view above. Click on a gene. **Good.** Now find the same gene in the copy of the chromosome and click on it. **Good.**

295   h   325

h   T C A G T T A T A A C T G A G C G C G C G G C C A A T C T G
      A G T C A A T A T T G A C T C G C G G C C G G G T T A G A C

295   H   325

H   T C A G T T A T A A C T G A G G G C G C G G C C A A T C T C
      A G T C A A T A T T G A C T C C C G C G C G G G T T A G A C

Above is the gene view of this chromosome. What do you notice about this view?