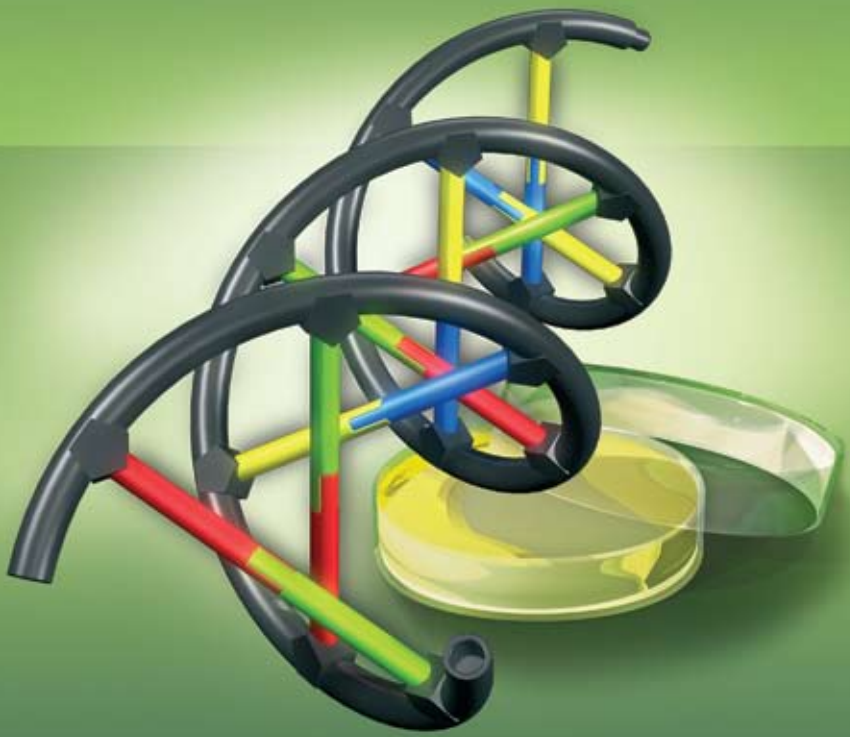
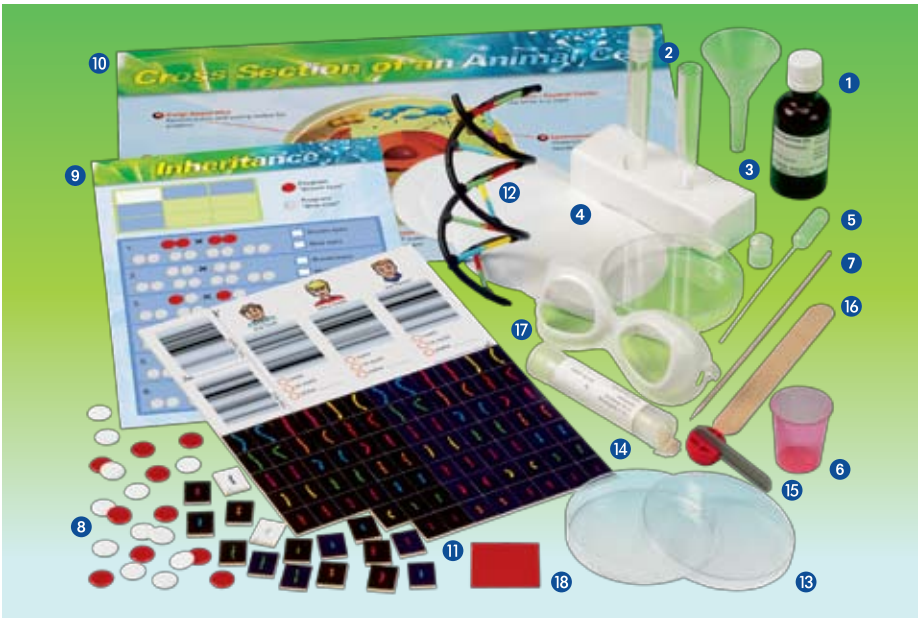
Thames & Kosmos®

GENETICS & DNA

Experiment Manual





No.	Description	Part	Part No.
1	Empty brown glass bottle with lid	1	772 093
2	Test tube with stopper	2	772 100
3	Funnel	1	086 228
4	Filter paper sheet	10	772 092
5	Pipette	1	232 134
6	Measuring cup	1	065 099
7	Wooden skewer	1	020 042
8	White and red plastic chips	12 each	705 818
9	Inheritance worksheet	1	705 897
10	Cell poster	1	705 820
11	Chromosome puzzle and genetic fingerprinting cards	1	705 819
12	DNA model	1	705 817
13	Petri dish	2	702 184
14	LB agar	2	705 815
15	Lid opener	1	070 177
16	Wooden spatula	1	000 239
17	Safety goggles	1	052 297
18	Red decoder film	1	161 415

Also Required

Denatured alcohol (methylated spirits), table salt, dish washing liquid, teaspoon, 2 yogurt containers, ruler, felt-tip pens, knife, scissors, permanent marker, plastic wrap, hand blender, tomato, jelly jar, microwave

In each experiment, materials that are required but not included in the kit are written in *cursive script*.

This red magnifying glass pops up over and over again in this manual. It shows where you can check your answer to a question by laying the red decoder film over the answer box.

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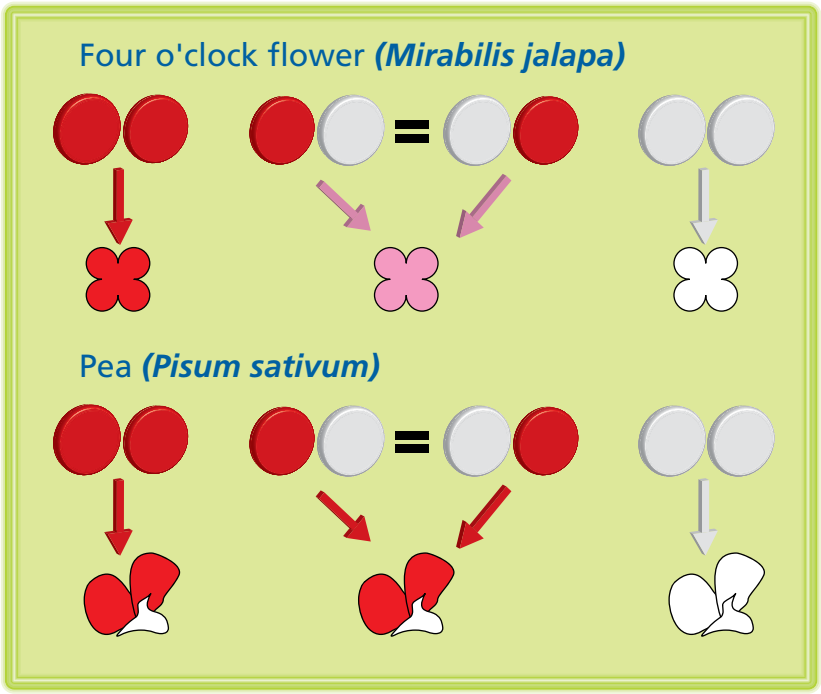
These are the possibilities:

a) If the programs complement each other equally, one program for red plus one for white would make pink flowers. This is what happens, for example, with the four o'clock flower, *Mirabilis jalapa*. One of these plants with a mixture of red and white programs does in fact have pink flowers.

Four o'clock flower

Pea

b) But it is also possible for one program to dominate the other: for example, for the red program to prevail against the white program, so that the offspring plant has only red flowers even if both red and white programs are present. That is exactly how Mendel's peas behaved.



08 Experiment

How features are passed on to offspring

The way that features were distributed was still unclear to Mendel. But on this topic, he had a few more ideas. After all his experiments, it suddenly became clear as day to him that each partner only passes on one copy of each program to the offspring and not all the copies. That makes sense, because otherwise the number of programs would double with each generation.

Luckily, it is much more orderly than that: Only one of two possible programs passes from the parents to the children — so each of the offspring logically ends up with two copies again.

Now we can explain which four combinations of the programs can arise from two different pea plants when they are crossed.

BRAIN TEASER:

Suppose each of your grandparents has two programs to pass on. Each of them passes both programs on to your parents, and each of them in turn to you. If it worked this way, how many programs would you have?

You will need:

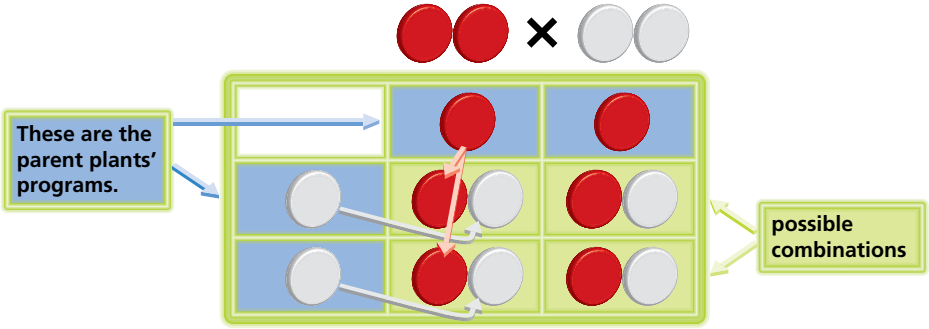
colored plastic chips

Here's how:

a) One pea should have two programs for red, the other should have two for white. By placing the colored chips in the grid drawing, you can easily figure out all possible combinations.

How it works:

In each case, one program from one parent is crossed with one program from the other.



The X indicates that pea plant 1 (red-red) is crossed with pea plant 2 (white-white). From that crossing, we get four possible pea plant offspring, all with red flowers.