



BASIC GENETICS

INTRODUCTION

Everyone can see that children resemble their parents. Offspring in general look and behave like their parents—at least in the sense that fish behave like fish and not like birds. How does that happen? We learned in the previous exercise that chromosomes and the genetic information they contain are divided exactly in half by a parent cell before they end up in gametes. Nowadays almost everyone knows that gametes fuse to form a new individual. But no one knew about chromosomes and meiosis, and certainly not DNA, until fairly recently.

In the middle of the 1800s, biologists (naturalists) were mainly observing and categorizing living organisms. Few were engaged in what we might think of today as experiments—working with precise methods, procedures, and data analysis. But an Austrian monk, Gregor Mendel, stood apart from most naturalists of his day. Through repeatable methodology and careful analysis of his data, he was able to discern two fundamental laws of genetics. His work, though neglected during his lifetime, today provides the foundation of genetics.

DISCUSSION

Mendel worked with *Pisum sativum*, the common garden pea. He observed characteristics of many individual pea plants—their stem length, the shape of their seeds, seed color, flower color, and so on. Today we call those physical characteristics “phenotypes” or “traits.” For example, we say “smooth” and “rough” are two possible phenotypes for the seed shape trait. Mendel noted distinct variations in the characteristics he observed—for example, he saw that seed color could be either green or yellow.