

GENETICS

The following activities are part of a series of science modules created by the Center for Inquiry-Based Learning (CIBL) and Teachers and Scientists Collaborating (TASC). The series is intended to supplement textbooks adopted in North Carolina, not to replace them. Like the textbooks, these modules align with the North Carolina Essential Standards. The activities in the series place students in the role of investigators, leaving some choices open-ended. The materials and activities are available only with prior professional development. At teachers' discretion, these exercises may replace or extend activities suggested in the texts. The goal is to help students deepen their understanding of underlying concepts and the scientific processes that generated them.

6 th Grade Modules	7 th Grade Modules	8 th Grade Modules
Cycling of Matter & Population Dynamics	Atmosphere	Cell Theory and Microbiology
Earth's Crust	Bodyworks	Chemistry
Energy and Waves	Thrill Ride	Change Through Time
The Solar System	Genetics	Hydrosphere

What follows is a pilot version of a science supplement in development. Please give us feedback at cibl@ciblearning.org or via our website at <http://www.ciblearning.org>.

Table of Contents

North Carolina Essential Standards.....	2
Aliens Have Landed	3
Genes and Chromosomes Model	7
Mitosis Model	23
My Family's Traits.....	29
Aliens Again!	35
Meiosis Model.....	51
Wilbur's and Wilma's Family, Part I.....	63
Wilbur's and Wilma's Family, Part II.....	75
Aliens One Last Time.....	87
Family Pedigree—Cleft Chin?.....	99
Alien Bugs	103
Crossword Challenge	119
Genetic Dilemmas	123

READ CAREFULLY BEFORE USING THIS SUPPLEMENT.

ANY USER OF THE **GENETICS** SUPPLEMENT PERMANENTLY RELEASES ALL CLAIMS OF ANY TYPE OR NATURE IN ANY WAY ASSOCIATED WITH ITS USE.

As a condition of using the **Genetics** supplement, the user **assumes any and all risks** attendant to these activities and materials, including claims resulting from uses in any way resulting from or associated with the activities or materials therein. The user is responsible for all issues of safety, health and welfare during activities. The user of the **Genetics** supplement **waives** any and all claims that may result from its use, and **releases and holds harmless** the TASC Program, The Center for Inquiry-Based Learning, and Duke University and its Board of Trustees, agents and employees from any and all claims, demands, causes of action or damages which may accrue on account of bodily or personal injury, property damage, or death arising from the use of the **Genetics** supplement.

North Carolina Essential Standards

This kit is designed with a “storyline” where one activity builds upon another. At the conclusion of this kit, students will have gained competency with the concepts in the following North Carolina Essential Standards:

7.L.2 Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation and survival among offspring.

- 7.L.2.1 Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).
- 7.L.2.2 Infer patterns of heredity using information from Punnett squares and pedigree analysis.
- 7.L.2.3 Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival.

Special Note

With students being exposed to the terms and symbols of genetics for the first time, we have found that it is important to walk them through examples slowly, carefully, and step by step. Once students get confused, it can be difficult to clarify these ideas for them. Err on the side of caution. In the procedures sections outlined in the following exercises we have presented some possible scripts (in italics and quotation marks). We have done this at the request of teachers in our workshops. Please feel free to use your own words. Answers to some of the questions are given in [brackets].

Blackline masters are provided in each exercise for photocopying worksheets and making transparencies.