

# Four-Color Theorem

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Graph Theory/Coloring Problems

Grades 6-8<sup>th</sup>

## Topics:

Graph Theory, Four-Color Theorem, Coloring Problems.

## Purpose:

Students will gain practice in graph theory problems and writing algorithms. They will learn the four-color theorem and how it relates to map coloring.

## Materials:

- 'Map Coloring' Worksheet...(you can find printable maps at <http://www.teachervision.com/lesson-plans/lesson-5104.html>)
- Crayons
- Computer for <http://www.utm.edu/departments/math/graph/>

## Time Required:

Introduction-5 min., Individual Work-15 min., Group work-15 min.,  
Conclusion/Discussion-15 min.

## Lesson Procedure:

1. Problem statement will be presented and discussed with the students.
2. Students will work individually on worksheet.
3. When each student has an algorithm they will get in groups to practice each persons steps.
4. Group will pick the best or combine several solutions and present it to the class.
5. Teacher will discuss her method of using vertices and edges to complete the problem.

## Explorations:

- Students will complete coloring problem tutorial at <http://www.utm.edu/departments/math/graph/>.

Assessment and Evaluation Tools:

- ❑ Observations
- ❑ Group presented solutions.
- ❑ Completion of tutorial.

Content Standard Connections:NCTM

- ❑ Make and investigate mathematical conjectures.
- ❑ Select and use various types of reasoning and methods of proof.
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Internet Sites:

<http://mathworld.wolfram.com/Four-ColorTheorem.html>

<http://www.colorado.edu/education/DMP/activities/graph/>

<http://www.utm.edu/departments/math/graph/>

Comments:

Peer Feedback: