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**Janet Fierson\*** ([fierson@lasalle.edu](mailto:fierson@lasalle.edu)), Dept. of Mathematics and Computer Science, La Salle University, 1900 W. Olney Ave., Philadelphia, PA 19141. *Coloring graphs and rainbow connection*. Preliminary report.

We introduce a new problem that links two topics in chromatic graph theory that have previously been studied independently: coloring graphs and rainbow connection. Given a graph  $G$  and positive integer  $k$ , the  $k$ -coloring graph of  $G$  is the graph with vertex set the proper  $k$ -colorings of  $G$  and edges between colorings that differ on exactly one vertex. In an edge-colored graph, a path is said to be a rainbow path if no two of its edges share a color; an edge-colored (but not necessarily properly edge-colored) graph is rainbow-connected if a rainbow path exists for every pair of vertices. The concept of the coloring graph has been investigated in the context of vertex coloring and edge coloring. We present a definition and results for the coloring graph as it applies to rainbow connection. (Received September 16, 2014)