

# Winners and Losers - The Geography of Inventions

Every big invention helps some people and hurts others.

A power saw, for example, helps people who build houses - it makes their job easier. At the same time, a power saw can hurt the business of some carpenters; their skill is not so valuable any more. It also hurts people who make or sharpen handsaws.

This principle is geographically important, because it also applies to places:

Big inventions make some places more valuable; other places may be hurt.

Think about the effects of automobiles. They make land around cities more valuable. People can live in those places and drive to work. At the same time, cars make places next to factories less valuable. People do not have to put up with the noise and smoke near a factory if they can drive to work from farther away.

We should also look at the connections between automobiles and other things. For example, cars need tires. This makes places that produce rubber more valuable. Cars also need gasoline. This helps places that have oil deposits or oil refineries. Meanwhile, places that are near train stations may lose value, because people with cars are less likely to ride trains. And so on, . . .

Here is a list of 30 important inventions.

cotton seed	axe	iron sword	brick chimney	wagon
wheat seed	2-man saw	gunpowder	power loom	canal
flour mill	circular saw	revolver	plastic	sailing ship
clay pot	wire nail	drone	light bulb	steamship
frying pan	bolt & nut	well drill & pump	refrigerator	telegraph
microwave	drill bit	barbed wire	airconditioner	radio

1. Pick one, or suggest another that is also important (not iPhone, computer, or internet!)
2. Do some background research.
  - What jobs or activities does this invention make easier or cheaper?
  - What jobs or activities does this invention make unnecessary or less valuable?
  - What else is needed for this invention to work properly (like a car needs tires)?
3. On a map, put a large plus sign on places that are really helped by this invention.
4. Put smaller plus signs on places that are helped a little by this invention.
5. Put minus signs of different sizes on places that might be hurt by this invention.
6. Arrange your map along with some explanatory notes in a poster or electronic presentation.

## Teacher's Notes – The Geography of Inventions

**Big idea:** Every big invention makes some places more valuable and reduces the value of other places. Those consequences occur in specific places because of the conditions at those places and/or their connections with other places. This is an extremely important principle of applied economic geography, with many implications for jobs, investment, and public policy.

### Subordinate objectives:

- to learn the raw material requirements and byproducts of some important industries
- to learn some geographic facts about a region that may be affected by a given invention
- to learn that places may “lose” as a result of a new invention, through no fault of the people who live there; a humane society should have ways to alleviate that problem

**Possible setup:** Imagine what it was like to be a banker when the Erie Canal opened. This invention provided a much better connection between New York City and cities on the Great Lakes – cities like Buffalo, Toronto, Detroit, Chicago, and all the smaller towns and farmland around them. If you were a banker in New York, you would be very happy, because the people shipping products down the Canal might use your services to help them trade. If you lived in Boston or Philadelphia, however, you would not be so happy, because it seems inevitable that some business would leave your city and move to New York. This lesson is about the geographic effects of big inventions.

**Possible alternative setup:** If someone invented a way to turn sand into gold, what would happen? Try to elicit some of these effects in a brainstorming session:

- Some people would be happy, because they live in areas that have sandy soil or bedrock.
- Others would be less thrilled, because they do not.
- People who design, build, and operate sand-mining equipment would also be happy.
- Owners of existing gold mines would probably be disappointed, because the price of gold would probably decrease when the new supply entered the market.

**Vocabulary:** change consequence invention investment raw material skill side effect

**Procedure:** The worksheet is the core of the activity. Like other activities in this book, this can be done as an individual worksheet, small-group activity, whole-class discussion (with or without a projector), or takehome project. It works better when a larger task (e.g. studying about the geography of jobs and income) justifies doing an activity like this in order to master the skill involved.

**Answers:** This activity is all about inquiry skills and plausibility. In general, inventions tend to help places where people:

- can use the invention to make life better in that place
- are able to make, sell, or repair the thing that was invented,
- grow, mine, or make essential parts for the invention,
- have economies that depend on activities that the invention makes easier or cheaper, or
- transport those supporting products to where the invention is made.

In general, inventions tend to hurt places where people:

- are not able to use the invention in their place, for whatever reason
- grow, mine, or make things that are no longer needed after people get the invention, or
- transport products that are no longer needed after people get the invention.

**Extensions, supplements, and GIS applications:** The lesson can fit into a general discussion of regional economies. Defining the conditions that promote inventiveness and entrepreneurship is one of the big questions that societies must ask and answer in order to succeed.

**Complication:** The biggest complication is also one of the main points of the lesson, namely that predicting the consequences of inventions is not easy. Learning how to predict those consequences in a specific place is like learning any important subject: with study and practice, a person can keep learning how to do it better. Failure to predict those consequences, on the other hand, can make adjusting to life after an economy-changing invention even more difficult and painful.