Ethics, Privacy, and Bias

(Also available in [CODAP](#))

Students consider ethical issues and privacy in the context of data science.

Lesson Goals	Students will be able to… • Describe ethical and privacy considerations when it comes to data science
Student-facing Lesson Goals	• Let's discuss ethical concerns surrounding data science.
Prerequisites	• [Introduction to Data Science](#)
Materials	*This lesson is unplugged and does not require a computer.* • [PDF of all Handouts and Page](#) ◦ [Case Study: Ethics, Privacy, and Bias](#) • [How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did (Forbes)](#) • [Facebook 'likes' can Reveal Your Secrets (Cnn)](#) • [Algorithmic Bias in Criminal Sentencing (Propublica)](#) • [Lesson Slides](#) • [Printable Lesson Plan](#) (a PDF of this web page)
Supplemental Materials	• *[Racial Bias in Algorithms used to determine Medical Care (Statnews)](#)* • *[Microsoft Shut Down its AI Teen Chatbot after it made Racist Tweets (Cbsnews)](#)*

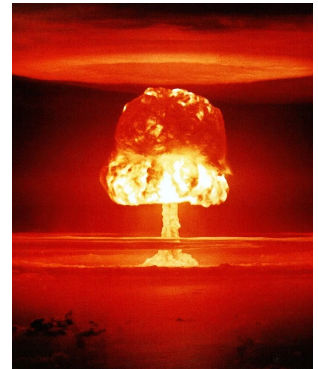# Case Studies   *40 minutes*

Overview

Students break into groups and read one of three case studies, each dealing with a different issue in Data Science. They discuss the implications of each, then share back.

Launch

1. Should scientists be bound by any ethical rules? If so, what rules?

During World War II, scientists were engaged in a race to develop new weapons, more powerful than anything the world had ever seen. While the immediate goal was "win the war", many of the scientists realized that the weapons they were developing could be used for all sorts of things *after the war was over* - and not all of them were good.

2. Should doctors be bound by any ethical rules? If so, what rules?

Between 1932 and 1972, doctors in the US gave syphillis to unknowing African-American citizens as part of an experiment. In 1971, researchers at Stanford conducted an experiment in human behavior that went horribly wrong, causing tremendous damage to their participants.

History is filled with examples of those who study science - be it medicine, human behavior, psychology, etc. - ignoring their ethical responsibility as humans.

3. Should data scientists be bound by any ethical rules? If so, what rules?

With tech companies hiring Data Scientists at a staggering rate and collecting massive datasets on users for those scientists to mine, there's a *new* arms race happening right now. Search engines tailor their results based on what they know about the customer doing the search, and social media networks want to recommend friends based on what they know about all of us.

Both goals require building profiles on everyone, figuring out what their preferences are and where they tend to spend their time. They might require figuring out whether each of us is young or old, more likely to go to a movie or a play, or about to buy sneakers or a phone.

But these datasets and profiles could be used for far more than that. What if the FBI used them to try and figure out who is likely to commit a crime, or a company tries to learn their employees' religion or sexual orientation?

As they build ever-more sophisticated models based on ever-more accurate datasets, Data Scientists need to think about the ethics of what they're doing as well!

Investigate

- In your group of 3-4 students, complete [Case Study: Ethics, Privacy, and Bias](#) on one of the articles below.

  - [How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did (Forbes)](#)

  - [Facebook 'likes' can Reveal Your Secrets (Cnn)](#)

  - [Algorithmic Bias in Criminal Sentencing (Propublica)](#)

- After your group completes the worksheet, one person from each group will share back with the class what your group learned.

Note: The third article is quite long, but only the first half is needed for students to complete this activity.

Synthesize

Give students time to discuss and share back. Encourage students to share back differing views on the articles.

- What are some commonalities and differences among the issues raised by these articles?

- **Should data scientists be bound by any ethical rules? If so, what rules?**

Additional Exercises

- Have students generate a list of "Rules for Ethical Data Science"?

- Have students write a one-page essay about their thoughts on the future of AI.

- Read this article on [Racial Bias in Algorithms used to determine Medical Care (Statnews)](). Write arguments for or against health care providers using algorithms to make medical decisions. You may even want to host a debate, giving students a chance to make "opening" and "closing" arguments, taking turns so that the closer for each side can respond to what the other side said.

- Watch or read CBS News Coverage from when [Microsoft Shut Down its AI Teen Chatbot after it made Racist Tweets (Cbsnews)]() and write a response.