Data visualizations are made up of layers. Each layer consists of three parts:

- **data**  
  *tabular dataset* associated with the layer

- **geom**  
  graphical element associated with each *observation*

- **aesthetics**  
  *mappings from properties of the plot that associate* *features* *in the dataset with elements of the geometry*

Complex plots can be constructed by putting together multiple layers.
data:  food
geom: point
aes:  \{ x: calories, y: total_fat \}  

Each observation in the food dataset is represented by a point.
Text Plot Example

data: food
geom: text
aes: { x: calories,
y: saturated_fat
label: item }

each observation in the food dataset is represented by a textual label
Segment Plot Example

data:  food
gem:  segment
aes:  { x: calories,
y: saturated_fat
xend: calories,
yend: total_fat }

each observation in the food
dataset is represented by a
vertical line segment
Arrow Plot Example

data: food
geom: segment (+ some options)
aes: { x: calories,
y: saturated_fat
xend: calories,
yend: total_fat }

each observation in the food
dataset is represented by a
vertical line segment plus an
arrow!
Syntax

data: food
geom: point
aes: { x: calories, y: total_fat }

food %>%
  ggplot() +
  geom_point(aes(x = calories, y = total_fat))

data: food
geom: text
aes: { x: calories,
       y: saturated_fat
       label: item }

food %>%
  ggplot() +
  geom_text(aes(x = calories, y = total_fat,
                label = item))
Fixed Aesthetics

data: food
g geom: segment
aes: { x: calories,
y: 0,
xend: calories,
yend: total_fat }

we can map an aesthetic to a fixed value rather than a feature

we will see even better examples of why this is useful next time!
Fixed Aesthetic Syntax

data:  food
genom: segment
aes:  \{ x: calories,  y: 0, xend: calories, yend: total_fat \}

food %>%
ggplot() +
geom_segment(aes(x = calories, xend = calories, yend = total_fat), y = 0)

fixed aesthetics go OUTSIDE the aes function
but inside the geom_* function