**OPERATORS/SYMBOLS**

+ - \* / (Math operators; - is also “exclude” in indexing; + is used in ggplot to add new elements)

? (Help operator)

# (Comments/annotation operator)

> (Ready prompt, but also “greater than”)

<- and = (Assignment operators for creating objects; = also to associate input w/ arguments)

NA (Missing value)

: (Create a simple sequence)

, (Dimension and argument separator)

! (Negates things--“not that”)

$ (Shortcut for indexing a data frame column)

%>% (Pipe for funneling output from one function to be input in another)

%in% (Matching operator--keeps things from left object that are also in right object)

~ (Separator in “formula notation”)

**CORE CONCEPTS**

**ASSIGNMENT** (creating objects and storing data)

name.of.object <- (or =) *values to store*  
 **FUNCTION CALLS** (using functions)

function.name(required.argument1, optional.argument2, …)

**INDEXING**

object.name[*value(s) to extract*] (or object.name[*row value(s)*, *column values(s)*])

**TURNING ON PACKAGES**

library(*package name*)

**USEFUL FUNCTIONS (Key arguments)**

* log(x, base)
* sqrt(x)
* round(x, digits)
* read.csv(path, stringsAsFactors)
* download.file(url, destfile)
* head(x); tail(x)
* dim(x); nrow(x); ncol(x)
* names(x); rownames(x)
* str(x)
* summary(x)
* seq(from, to, by)
* c(values to combine separated by commas)
* mean(x, trim, na.rm)
* range(x, na.rm)
* is.na(x)
* na.omit(x)
* factor(x, levels)
* table(x)
* plot(x)
* ggplot(data, mapping = aes(…))
* geom\_point(); geom\_line(); geom\_histogram(bins); geom\_boxplot(); geom\_jitter()
* aes(size, alpha, color, group, …)
* scale\_x(or y)\_... (functions to adjust x and y axes)
* n()
* facet\_wrap( ~ ) and facet\_grid (*rows* ~ *columns*)
* theme()
* ggsave(filename, plot, height, width)