## ► ACTIVITY 8.6

Using Technology

Fitting Exponential Models

In Chapter 5, you learned that you can use a graphing calculator to find a best-fitting line. A graphing calculator can also be used to find a best-fitting exponential growth or decay model.

► EXAMPLE

A rubber ball is dropped from a height of 0.82 meter. Using a CBL unit, the height of the ball on each successive bounce was recorded. The *x*-values represent the bounce and the *y*-values represent the height. Use a graphing calculator to find an exponential model for these data.

x	0	1	2	3	4	5	6	7	8	9
y	0.82	0.64	0.50	0.39	0.30	0.24	0.18	0.14	0.11	0.08

► SOLUTION

1 Enter the ordered pairs into the graphing calculator. Select L_1 as the *x* list and L_2 as the *y* list.

```
L1        L2        L3
3         .39
4         .3
5         .24
6         .18
7         .14
L2(7)=.14
```

2 Use exponential regression to find an exponential model. The equation $y = 0.8335(0.7744)^x$ is the best-fitting exponential model.

```
ExpReg
y=a*b^x
a=.8335285282
b=.7744237345
r=-.999651131
```
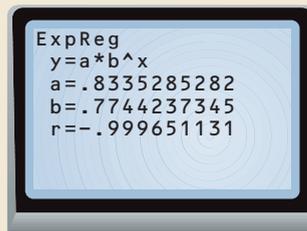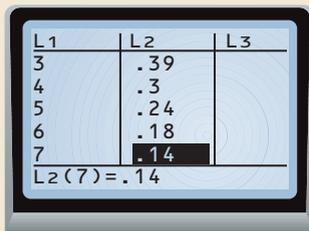
3 Set the viewing rectangle so that $0 \le x \le 20$ and $0 \le y \le 1$.

```
WINDOW
Xmin=0
Xmax=20
Xscl=1
Ymin=0
Ymax=1
Yscl=.1
```

4 Graph the equation $y = 0.8335(0.7744)^x$.
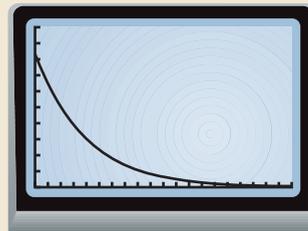
► EXERCISES

Use a graphing calculator to find the best-fitting exponential growth model for the points.

1. (0, 1), (1, 1.4), (2, 3), (3, 5), (4, 8), (5, 12), (6, 20), (7, 30), (8, 50), (9, 80)

2. (0, 0.5), (2, 0.8), (3, 1), (4, 1.4), (5, 1.8), (6, 2.7), (7, 3.6), (8, 4.9), (9, 7)