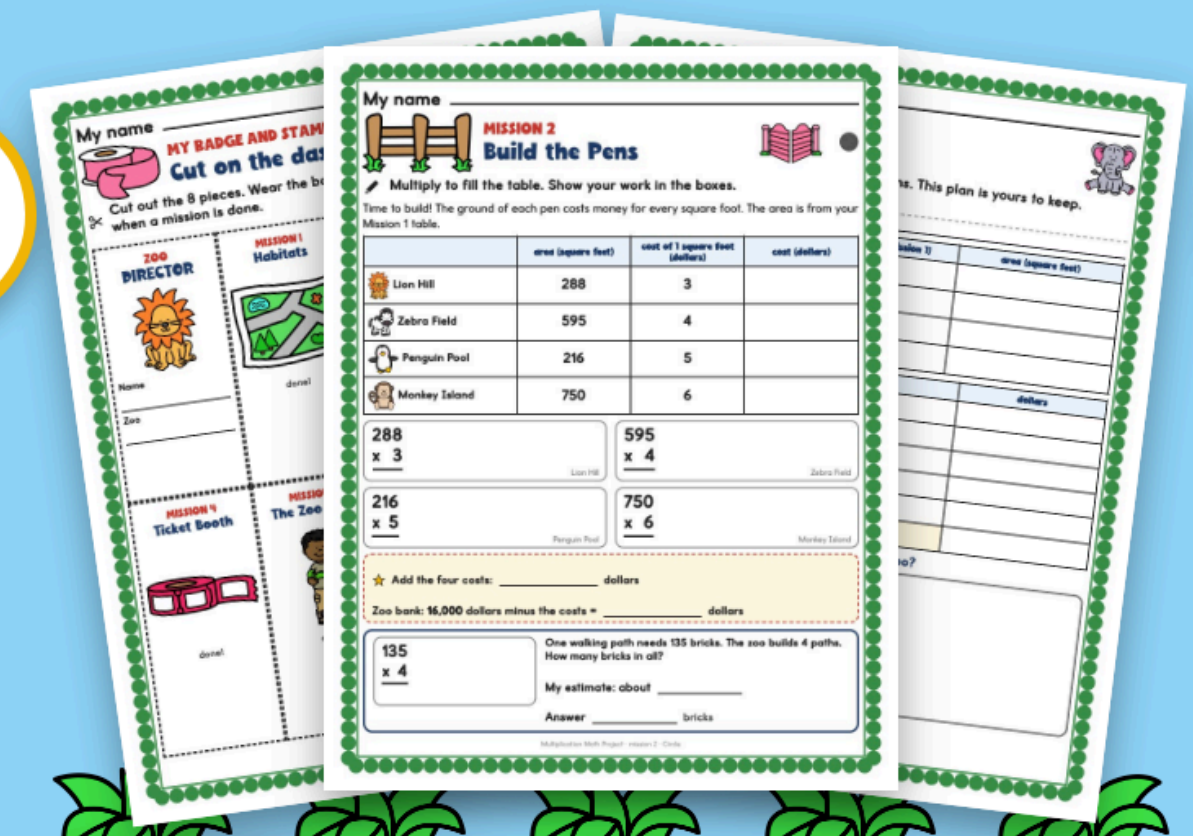
MULTIPLICATION MATH PROJECT

ZOO DIRECTOR

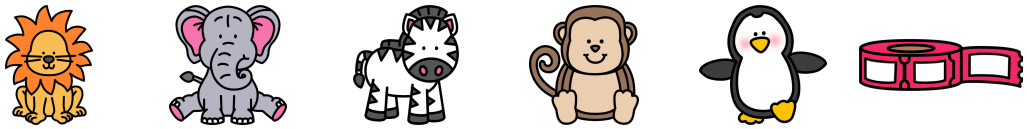
MULTI-DIGIT · GRADES 4-5

46 PAGES

3 LEVELS



Start Here: Zoo Director



Your students are hired as the director of Sunny Hill Zoo, an invented zoo with 31 animals and four pens. Six missions each put a **data table** in front of the child: pen areas, the cost to build, the food bill, the ticket booth, the zoo team and the gift shop. The child multiplies to fill the table, then solves a follow-up word problem with an estimate first. **Each part feeds the next**: the Mission 1 areas are the Mission 2 areas, and a Zoo Bank strip on every mission page carries the zoo's money from one mission to the next, from the grant at the start to the money left at the end.

The three steps

1. **Hire.** Read the role letter (page 4), sign the contract, cut out the badge and stamps (page 5). 2. **Missions.** Give each child the six mission pages for one shape. A finished mission earns its stamp on the tracker (page 6). 3. **Plan.** The Zoo Plan and Zoo Bank (pages 30-31) are the finished pages the child keeps, then the sign-off (page 32) and the certificate (page 45).

What is inside

Part	Pages	What it is
Hire the Director	4-6	Role letter and contract, badge and stamps to cut, mission tracker.
Teach two skills	7-8	Three ways to multiply (area model, partial products, stacked) and estimating first.
Circle missions 1-6	9-14	2- and 3-digit by 1-digit.
Square missions 1-6	15-20	2-digit by 2-digit, and 3- and 4-digit by 1-digit.
Triangle missions 1-6	21-26	3-digit by 2-digit, and 4-digit by 2-digit.
Director's Challenges	27-29	Four two-step problems per level, one page each.
Zoo Plan, Zoo Bank, sign-off	30-32	The finished plan the child keeps, the bank ledger, a checklist.
Examples	33-35	Mission 2, the Zoo Plan and the Zoo Bank, completed by Sam, an invented student.
Answer keys	36-43	One page per mission with all three levels, then the lessons, plan, bank and challenges.
Family letter, certificate	44-45	A note home and a Zoo Director certificate to fill in.

Three levels, marked with a shape

● **Circle**: 2- and 3-digit by 1-digit. ■ **Square**: 2-digit by 2-digit, and 3- and 4-digit by 1-digit. ▲ **Triangle**: 3-digit by 2-digit, and 4-digit by 2-digit.

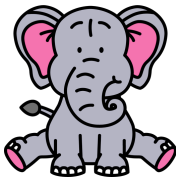
The shape is the only mark of the level, so three children at one table can work three levels. 122 multiplication problems in the missions and challenges (96 table products, 14 follow-ups, 12 challenges). Every price, wage and count is invented for practice. Nothing is scored. Print, or type into the tables; the work boxes are for pencil.

PREVIEW

My name _____



YOU ARE HIRED!
Zoo Director



Read the letter. Add up the animals. Then sign your contract.

Dear Director, welcome to Sunny Hill Zoo! Our zoo is brand new and we need a director. You will plan the pens, pay to build them, feed the animals, run the ticket booth, hire the team and open the gift shop. Every part uses multiplication, and every part spends or earns money from the zoo bank. Here is who lives at the zoo (all of the numbers in this project are made up).

Lions at the zoo	**3**
Zebras at the zoo	**7**
Penguins at the zoo	**12**
Monkeys at the zoo	**9**

Animals in all 3 + 7 + 12 + 9 = _____

You will plan 4 pens. Each pen is a home for one kind of animal.

Your six missions



1. Habitats



2. Build the Pens



3. Feed the Animals



4. Ticket Booth



5. The Zoo Team



6. Gift Shop

My shape: ▢ ● ▢ ■ ▢ ▲ (your teacher picks it with you)

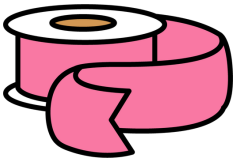
Zoo Director's contract

I, _____, accept the job of Zoo Director. I will estimate first, multiply carefully, show my work and keep the zoo bank right.

Signed **Date**

PREVIEW

My name _____

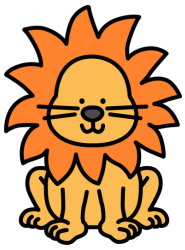


MY BADGE AND STAMPS

Cut on the dashed lines

Cut out the 8 pieces. Wear the badge. Glue a stamp on your tracker when a mission is done.

ZOO
DIRECTOR



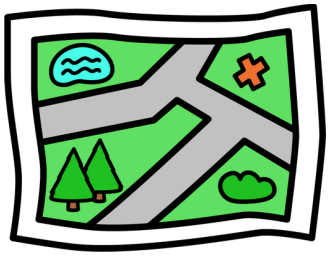
Name

_____

Zoo

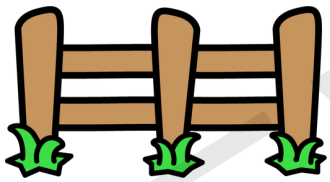
_____

MISSION 1
Habitats



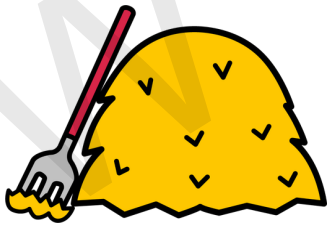
done!

MISSION 2
Build the Pens



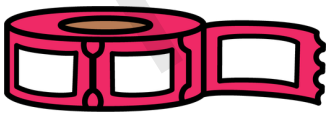
done!

MISSION 3
Feed the Animals



done!

MISSION 4
Ticket Booth



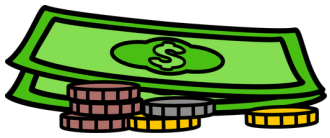
done!

MISSION 5
The Zoo Team



done!

MISSION 6
Gift Shop



done!

STAMP
Plan filed



Zoo Plan

PREVIEW

Preview - Bright Path Shed

My name _____

BEFORE THE MISSIONS

Three ways to multiply

See 34 x 26 done three ways. Then try three of your own.

1. Area model

	30	4
20	600	80
6	180	24

600 + 80 + 180 + 24
= 884

2. Partial products

Multiply by the ones. Multiply by the tens. Add.

34 x 6 = 204

34 x 20 = 680

204 + 680 = 884

3. Stacked

The same two steps, stacked. The second row starts with a zero place.

```
  34
x 26
----
 204
 680
----
 884
```

All three give 884. Pick the way that makes sense to you, and check with a second way.

Try it

42 x 35

	40	2
30		
5		

```
  42
x 35
----
```

Answer _____

63 x 24

	60	3
20		
4		

```
  63
x 24
----
```

Answer _____

58 x 47

	50	8
40		
7		

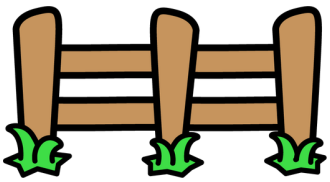
```
  58
x 47
----
```

Answer _____

PREVIEW

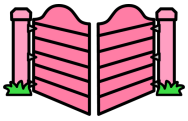
Preview - Bright Path Shed

My name _____



MISSION 2

Build the Pens



Multiply to fill the table. Show your work in the boxes.

Time to build! The ground of each pen costs money for every square foot. The area is from your Mission 1 table.

	area (square feet)	cost of 1 square foot (dollars)	cost (dollars)
Lion Hill	288	3	
Zebra Field	595	4	
Penguin Pool	216	5	
Monkey Island	750	6	

288
x 3
Lion Hill

595
x 4
Zebra Field

216
x 5
Penguin Pool

750
x 6
Monkey Island

★ **Add the four costs:** _____ **dollars**

Zoo bank: 16,000 dollars minus the costs = _____ **dollars**

135
x 4

One walking path needs 135 bricks. The zoo builds 4 paths. How many bricks in all?

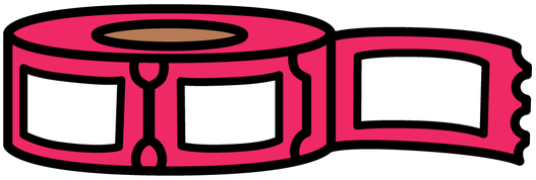
My estimate: about _____

Answer _____ **bricks**

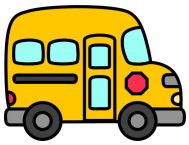
PREVIEW

Preview - Bright Path Shed

My name _____



MISSION 4
Ticket Booth



Multiply to fill the table. Show your work in the boxes.

Opening weekend! Visitors lined up at the gate. Find how much money each kind of ticket earned.

	sold	price of one (dollars)	money earned (dollars)
Kid tickets	218	3	
Adult tickets	154	6	
Group packages	87	4	
Memberships	63	5	

218
x 3
Kid tickets

154
x 6
Adult tickets

87
x 4
Group packages

63
x 5
Memberships

★ **Add the four ticket money:** _____ **dollars**

Zoo bank: 4,215 dollars plus the money earned = _____ **dollars**

48
x 6

A school trip buys 48 tickets. Each ticket costs 6 dollars. How much does the school pay?

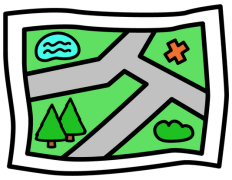
My estimate: about _____

Answer _____ **dollars**

PREVIEW

Preview - Bright Path Shed

My name _____



MISSION 1
Habitats



Multiply to fill the table. Show your work in the boxes.

You are the new director of Sunny Hill Zoo. Plan the four pens. Find the area of each: length times width.

	length (feet)	width (feet)	area (square feet)
Lion Hill	36	24	
Zebra Field	48	35	
Penguin Pool	27	18	
Monkey Island	52	46	

36
x 24

Lion Hill

48
x 35

Zebra Field

27
x 18

Penguin Pool

52
x 46

Monkey Island

★ **Add the four areas for your Zoo Plan:** _____ **square feet**
The zoo bank starts with 46,000 dollars. It goes from mission to mission.

78
x 35

The picnic lawn is 78 feet long and 35 feet wide. What is its area?

My estimate: about _____

Answer _____ **square feet**

PREVIEW

Preview - Bright Path Shed

My name _____



MISSION 3

Feed the Animals



Multiply to fill the table. Show your work in the boxes.

Feed the animals: pounds eaten, then the food cost. One pound's price is under each name.

	pounds a day	days	pounds in all	cost (dollars)
Lion meat 7 dollars a pound	24	28		
Zebra hay 3 dollars a pound	45	28		
Penguin fish 6 dollars a pound	36	28		
Monkey bananas 9 dollars a pound	18	28		

28
x 24

Lion 1

x 7

Lion 2

45
x 28

Zebra 1

x 3

Zebra 2

36
x 28

Penguin 1

x 6

Penguin 2

28
x 18

Monkey 1

x 9

Monkey 2

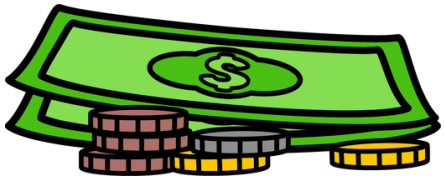
★ **Add the four food costs:** _____ **dollars**

Zoo bank: 22,142 dollars minus the costs = _____ **dollars**

PREVIEW

Preview - Bright Path Shed

My name _____



MISSION 6
Gift Shop



Multiply to fill the table. Show your work in the boxes.

The gift shop is open! Find how much money each thing earned.

	sold	price of one (dollars)	money earned (dollars)
Plush animals	46	18	
Postcards	235	6	
Snack bags	178	7	
Zoo hats	54	25	

46
x 18

Plush animals

235
x 6

Postcards

178
x 7

Snack bags

54
x 25

Zoo hats

★ **Add the four gift shop money:** _____ **dollars**

Zoo bank: 1,061 dollars plus the money earned = _____ **dollars**

96
x 36

The gift shop orders 36 boxes of postcards. Each box has 96 cards. How many postcards?

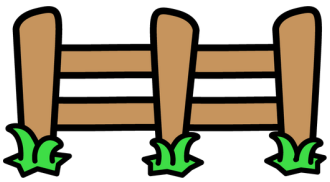
My estimate: about _____

Answer _____ **postcards**

PREVIEW

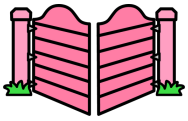
Preview - Bright Path Shed

My name _____



MISSION 2

Build the Pens



Multiply to fill the table. Show your work in the boxes.

Time to build! The ground of each pen costs money for every square foot. The area is from your Mission 1 table.

	area (square feet)	cost of 1 square foot (dollars)	cost (dollars)
Lion Hill	4,000	12	
Zebra Field	9,630	14	
Penguin Pool	3,848	15	
Monkey Island	8,968	13	

4,000
x 12

Lion Hill

9,630
x 14

Zebra Field

3,848
x 15

Penguin Pool

8,968
x 13

Monkey Island

★ **Add the four costs:** _____ **dollars**

Zoo bank: 651,000 dollars minus the costs = _____ **dollars**

385
x 24

One walking path needs 385 bricks. The zoo builds 24 paths. How many bricks in all?

My estimate: about _____

Answer _____ **bricks**

PREVIEW

Preview - Bright Path Shed

My name _____



MISSION 5

The Zoo Team

Multiply to fill the table. Show your work in the boxes.

Hire the team: hours worked, then the pay. One hour's pay is under each name.

	people	hours each	hours in all	pay (dollars)
Animal keepers 13 dollars an hour	12	160		
Ticket takers 14 dollars an hour	18	120		
Cleaners 12 dollars an hour	15	144		
Guides 15 dollars an hour	19	175		

160
x 12

Animal 1

x 13

Animal 2

120
x 18

Ticket 1

x 14

Ticket 2

144
x 15

Cleaners 1

x 12

Cleaners 2

175
x 19

Guides 1

x 15

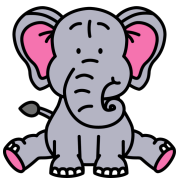
Guides 2

★ **Add the four pay costs:** _____ **dollars**

Zoo bank: 132,095 dollars minus the costs = _____ **dollars**

PREVIEW

My name _____



DIRECTOR'S CHALLENGE

Two steps to solve

Estimate. Work in the box. Write the exact answer.

1. A bus brings 36 students. A student ticket is 8 dollars. 3 teachers come too, at 12 dollars each. How much do they pay in all?

About _____

Exactly _____

2. One penguin eats 14 fish a day. The zoo has 8 penguins. How many fish do all the penguins eat in 6 days?

About _____

Exactly _____

3. The gift shop sold 96 plush animals at 7 dollars each and 45 postcards at 3 dollars each. How much money is that?

About _____

Exactly _____

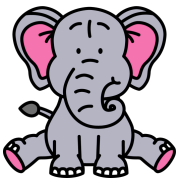
4. A new path is 289 feet long. Workers lay 6 bricks in each foot of path. How many bricks do they need? Round 289 first to see if your answer is close.

About _____

Exactly _____

PREVIEW

My name _____



DIRECTOR'S CHALLENGE

Two steps to solve

Estimate. Work in the box. Write the exact answer.

1. 246 students and 18 teachers visit. A student ticket is 14 dollars and a teacher ticket is 22 dollars. How much do they pay in all?

About _____

Exactly _____

2. The zoo uses 125 pounds of hay a day. Hay costs 13 dollars for each pound. How much does the hay cost for 28 days?

About _____

Exactly _____

3. The gift shop sold 1,235 postcards at 12 dollars each and 378 plush animals at 24 dollars each. How much money is that?

About _____

Exactly _____

4. A new path is 415 feet long and 24 feet wide. Paving costs 17 dollars for each square foot. How much will the paving cost?

About _____

Exactly _____

PREVIEW

My name _____



LAST STEP

Director's Sign-off

Tick each line when it is true.

- [ ] My name is on every mission page.
- [ ] Every table box has a number in it.
- [ ] I showed my work in every box.
- [ ] I estimated first on the follow-ups.
- [ ] I filled in the zoo bank strip on every mission.
- [ ] I glued my six stamps on the tracker.
- [ ] My Zoo Plan and Zoo Bank are finished.

Color 1, 2 or 3 circles: how much I liked each mission

1. Habitats	○ ○ ○	2. Build the Pens	○ ○ ○
3. Feed the Animals	○ ○ ○	4. Ticket Booth	○ ○ ○
5. The Zoo Team	○ ○ ○	6. Gift Shop	○ ○ ○

The hardest mission was

_____

because

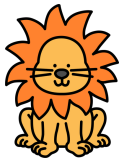
_____

One thing I learned about multiplying big numbers

Director Teacher

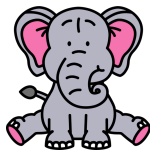
PREVIEW

My name Sam (an invented student)



THE ZOO PLAN I KEEP

My Zoo Plan



Copy your numbers from the missions. This plan is yours to keep.

My zoo is called Sunny Hill Zoo

	My four pens (Mission 1)	area (square feet)
	Lion Hill	288
	Zebra Field	595
	Penguin Pool	216
	Monkey Island	750

Money (Missions 2 to 6)	dollars
Building the pens (Mission 2)	8,824
Food for the animals (Mission 3)	2,961
Ticket money earned (Mission 4)	2,241
Staff pay (Mission 5)	4,932
Gift shop money earned (Mission 6)	2,671
Money left in the zoo bank	4,195

Come visit! What will visitors see and love at my zoo?

Come see the lions on Lion Hill and the penguins in their big pool! We opened with 16,000 dollars and still have 4,195 dollars left.

Director Sam Date

PREVIEW

Answer Key: Mission 2, Build the Pens

Check: estimate first (round to the biggest place), then multiply a second way. Any correct method is fine: area model, partial products or stacked.

● Circle level (page 10)

	area (square feet)	cost of 1 square foot (dollars)	cost (dollars)	work
Lion Hill	288	3	864	288 x 3 = 864
Zebra Field	595	4	2,380	595 x 4 = 2,380
Penguin Pool	216	5	1,080	216 x 5 = 1,080
Monkey Island	750	6	4,500	750 x 6 = 4,500

Zoo bank strip: the four costs add to **8,824**. 16,000 - 8,824 = **7,176** dollars.

Follow-up: 135 x 4 = **540 bricks** (estimate: about 400).

■ Square level (page 16)

	area (square feet)	cost of 1 square foot (dollars)	cost (dollars)	work
Lion Hill	864	4	3,456	864 x 4 = 3,456
Zebra Field	1,680	3	5,040	1,680 x 3 = 5,040
Penguin Pool	486	7	3,402	486 x 7 = 3,402
Monkey Island	2,392	5	11,960	2,392 x 5 = 11,960

Zoo bank strip: the four costs add to **23,858**. 46,000 - 23,858 = **22,142** dollars.

Follow-up: 64 x 18 = **1,152 bricks** (estimate: about 1,200).

▲ Triangle level (page 22)

	area (square feet)	cost of 1 square foot (dollars)	cost (dollars)	work
Lion Hill	4,000	12	48,000	4,000 x 12 = 48,000
Zebra Field	9,630	14	134,820	9,630 x 14 = 134,820
Penguin Pool	3,848	15	57,720	3,848 x 15 = 57,720
Monkey Island	8,968	13	116,584	8,968 x 13 = 116,584

Zoo bank strip: the four costs add to **357,124**. 651,000 - 357,124 = **293,876** dollars.

Follow-up: 385 x 24 = **9,240 bricks** (estimate: about 8,000).

Notes

PREVIEW

Answer Key: Mission 4, Ticket Booth

Check: estimate first (round to the biggest place), then multiply a second way. Any correct method is fine: area model, partial products or stacked.

● Circle level (page 12)

	sold	price of one (dollars)	money earned (dollars)	work
Kid tickets	218	3	654	218 x 3 = 654
Adult tickets	154	6	924	154 x 6 = 924
Group packages	87	4	348	87 x 4 = 348
Memberships	63	5	315	63 x 5 = 315

Zoo bank strip: the four ticket money add to **2,241**. 4,215 + 2,241 = **6,456** dollars.

Follow-up: 48 x 6 = **288 dollars** (estimate: about 300).

■ Square level (page 18)

	sold	price of one (dollars)	money earned (dollars)	work
Kid tickets	1,248	3	3,744	1,248 x 3 = 3,744
Adult tickets	856	6	5,136	856 x 6 = 5,136
Group packages	38	24	912	38 x 24 = 912
Memberships	27	45	1,215	45 x 27 = 1,215

Zoo bank strip: the four ticket money add to **11,007**. 3,074 + 11,007 = **14,081** dollars.

Follow-up: 67 x 24 = **1,608 dollars** (estimate: about 1,400).

▲ Triangle level (page 24)

	sold	price of one (dollars)	money earned (dollars)	work
Kid tickets	1,248	12	14,976	1,248 x 12 = 14,976
Adult tickets	856	18	15,408	856 x 18 = 15,408
Group packages	138	24	3,312	138 x 24 = 3,312
Memberships	235	45	10,575	235 x 45 = 10,575

Zoo bank strip: the four ticket money add to **44,271**. 87,824 + 44,271 = **132,095** dollars.

Follow-up: 185 x 36 = **6,660 dollars** (estimate: about 8,000).

Notes

PREVIEW

Answer Key: Lessons, Zoo Plan and Zoo Bank

Three ways to multiply (page 7)

- Worked: 34 x 26 = **884** (area model 600 + 80 + 180 + 24; partial products 34 x 6 = 204, 34 x 20 = 680).
- Try it 1: 42 x 35 = **1,470** (parts 1,200 + 60 + 200 + 10).
- Try it 2: 63 x 24 = **1,512** (parts 1,200 + 60 + 240 + 12).
- Try it 3: 58 x 47 = **2,726** (parts 2,000 + 320 + 350 + 56).

Estimate first (page 8)

The worked rows round to the biggest place. Try it:

- 82 x 7: round 80 x 7 = about 560; exact **574**; near.
- 296 x 3: round 300 x 3 = about 900; exact **888**; near.
- 38 x 42: round 40 x 40 = about 1,600; exact **1,596**; near.
- 515 x 6: round 500 x 6 = about 3,000; exact **3,090**; near.

My Zoo Plan (page 30): the six starred numbers

Starred number	● Circle	■ Square	▲ Triangle
Mission 1: Total area of my four pens	1,849 square feet	5,422 square feet	26,446 square feet
Mission 2: Cost to build the pens	8,824 dollars	23,858 dollars	357,124 dollars
Mission 3: Cost of food	2,961 dollars	19,068 dollars	206,052 dollars
Mission 4: Ticket money earned	2,241 dollars	11,007 dollars	44,271 dollars
Mission 5: Staff pay	4,932 dollars	13,020 dollars	130,995 dollars
Mission 6: Gift shop money earned	2,671 dollars	4,834 dollars	33,710 dollars

The four pen areas on the plan are the Mission 1 areas, in order: Lion Hill, Zebra Field, Penguin Pool, Monkey Island.

My Zoo Bank (page 31)

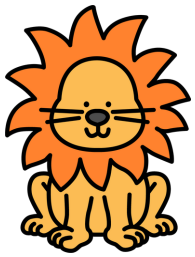
Level	Grant	Spent (build, food, staff)	Earned (tickets, gift shop)	Money left	Earned more than spent?
Circle	16,000	16,717	4,912	4,195	no
Square	46,000	55,946	15,841	5,895	no
Triangle	651,000	694,171	77,981	34,810	no

Every running balance in the ledger is on the Mission 2 to 6 answer keys ("bank after"). The sign-off, the "come visit" box and the "what I would change" box have no single right answer: look for the child's own numbers in sentences. The examples on pages 33-35 are at the circle level, by Sam, an invented student.

Notes

PREVIEW

Our Multiplication Math Project



Date: _____

Dear family of _____,

Your child has been hired as the director of an invented zoo with four pens. Over six missions they multiply to find the area of each pen, the cost to build it, the food bill, the money from tickets, the zoo team's pay and the gift shop's sales, and a zoo bank carries the money from one mission to the next. They estimate first, then find the exact answer. The numbers are made up for practice, and nothing has to be bought.

Ask your Director

- "Show me how you found the area of one pen. Can you do it a second way?"
- "What was your estimate? Was the exact answer near it?"
- "How did the zoo bank change from mission to mission?"

Make up a zoo problem with something at home (cookies, chairs, steps). Write it and solve it here.

Your child's Zoo Director certificate comes home when the Zoo Plan is filed.

From _____ Questions? _____

PREVIEW