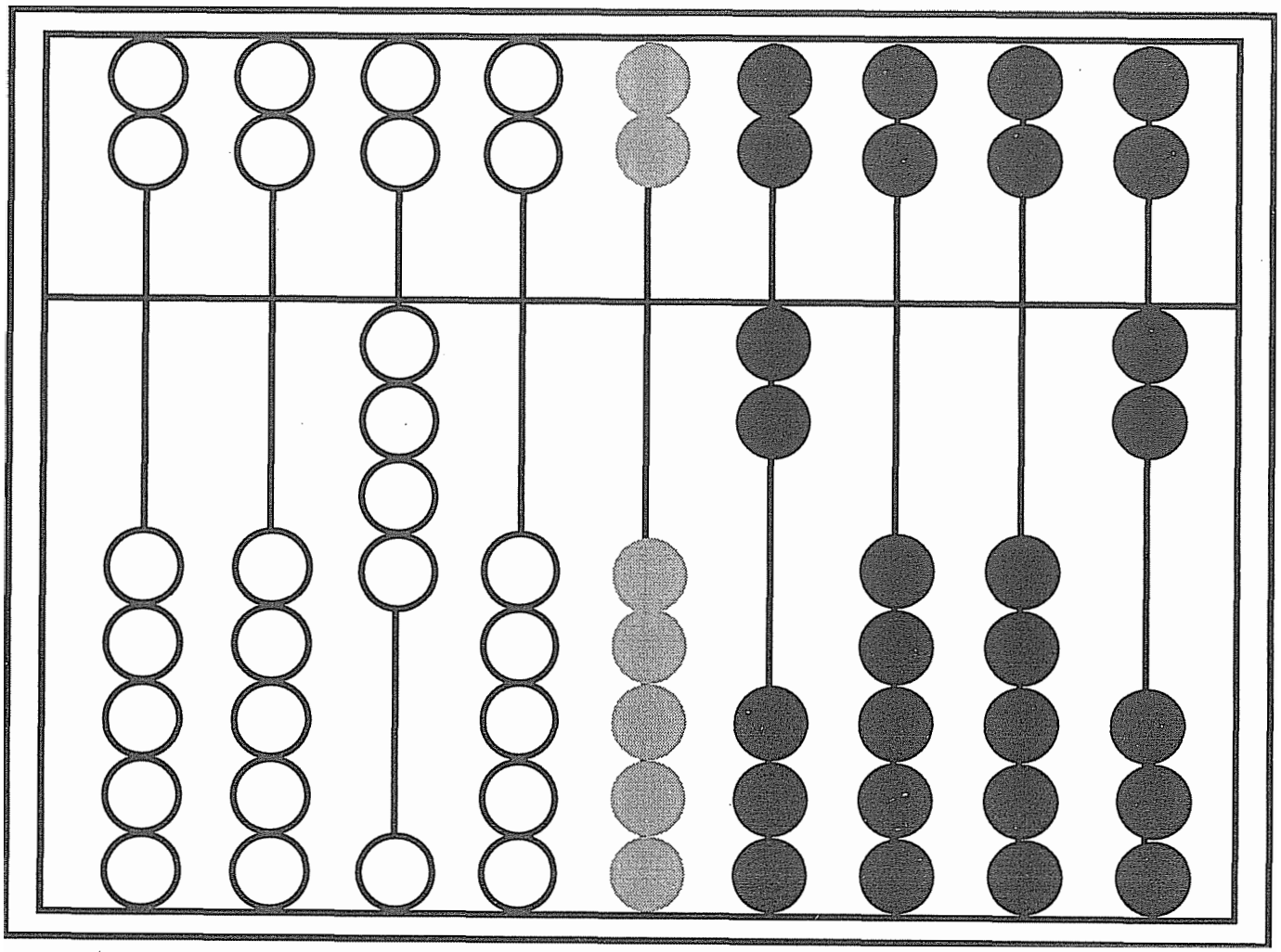
Abacus

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Edited by Frances Schatz

▲ From the Editor's Desk

When this issue arrives in your mailbox, we can look forward to spring and warm weather. In December Frank and I enjoyed some extra time in warm weather by joining our family on a Caribbean cruise, a wonderful memorable experience.

On the ship, I visited the Fun Factory where children are entertained with games, mini-tours, movies, and facts about the ship. A ten year old boy looked puzzled when he looked at the facts sheet so I took some time to chat with him. When I asked him why the frown, he told me, "In my country we only study metric and I don't understand all these measurements." We're both from Ontario and he was delighted when I showed him how he could use a calculator to convert the measures to metric. This metric matter came up again last week when I went shopping for curtain material for two windows. I know the material is sold in metres so I measured my windows in centimetres to determine how much I needed. The fabric clerk felt I wouldn't have enough material; she converted my measurements to inches and told me how many yards I would need, and then put the yards into metres. It was amazing – we both had the same calculation but what a lot of work just because the clerk wasn't happy in the language of metric measure. I came home with the ship facts sheet and developed **Ship Puzzle** for your students to enjoy.

When my project is *Abacus* or when I am reading the Grade 1 to 8 mathematics curriculum, I often reflect on how I learned the number facts and related arithmetic. Colours and dots come into my head but I just could not "see" the relationship. Over the holidays I had a chance to go through the boxes my mother had packed away years ago and I found some answers. Mother was meticulous at packing, labelling, and writing notes about things. One item was the box of 28 dominoes that had white dots, and the other was the double-nine colour-dot dominoes. Inside the latter box was a note: "Granny and Frances (age 6) played various domino games (instructions written), then one day Frances (age 8) asked why the dominoes didn't go to nine. Granny gave this set to Frances (1955) who enjoyed many hours of solitary entertainment with these."

I have included the instructions and activities that I enjoyed doing as a child. If you need a set of dominoes, I have provided a page of dominoes that you can put on stiff cardboard and cut out for project use. If you would like to have a free set of colourful double-nine dominoes, then try the **Magic Square** contest.

Children are reading about wizards (*Harry Potter* stories) and I have included some arithmetic wizardry. I highly recommend the book, *Rapid Math Tricks and Tips –30 days to number power* by Edward H. Julius for anyone who wants to learn some old-fashioned arithmetic power.

If you have an activity that you enjoy using in your K-8 class, be sure to forward it to me for use in the *Abacus*. If there is an activity you would like to see in *Abacus*, please tell me about it and I will do the research.

Frances Schatz

Frances Schatz

▲ Dominoes: Teacher Notes

- Dominoes will demonstrate the one-to-one correspondence between numbers and objects from 0 to 9. Use number names for the set of pips on a domino.
- Dominoes give a representation of counting and can demonstrate addition such as 3+6=9. The domino with 3 and 6 has the same number of pips as the domino with 0 and 9.
- Basic addition can be illustrated using domino pieces.
- A domino in the vertical direction can be used to illustrate proper fractions such as ½, ⅔, ⅐. How many different fractions are possible? The whole number 1 can be illustrated by ⅔, ⅜, up to ⅝.
- In patterning and algebra, dominoes can be used to show similarities and differences in attributes such as order, shape and colour. Compare the patterns. Look at the pattern that shows how 8 is two times 4. Find an order for lining up the 56 dominoes.
- Domino game gives practice in putting similar patterns together.
- Dominoes can be used for sorting exercises in data management. Why does a double-nine set have 56 pieces?

Game of Pips

Number of Players: 2 to 6

Materials: Double-Nine set of 56 dominoes

Object of the Game: To be the first to use up all the dominoes or lowest score at the end of the game.

Terminology:

BONE – name given to a domino piece.

BONEYARD – draw pile in the centre of the table.

DOUBLE – same on both ends.

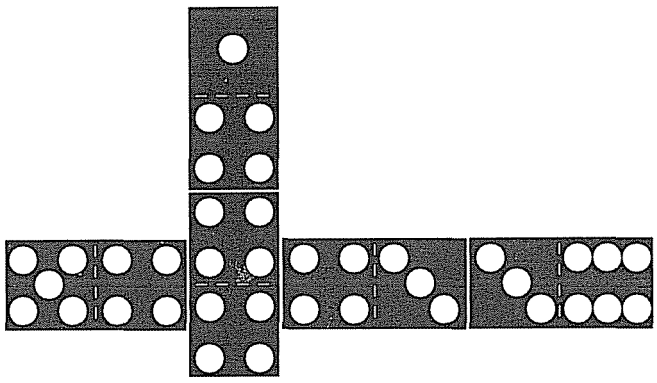
PIP – number of coloured dots on each end of the domino piece.

Game:

Turn all bones facedown in front of the players. Shuffle the bones. Each player draws 5 bones and hides them in front of him/her. Opponents should not be able to see the faces of your bones. The player who draws the highest double begins play. If no player has a double then highest total on a bone is the starter. Play continues left.

The second player then tries to match a bone to an end of the first player's bone.

If a double is on the table, the second play can go on the side or the end as long as the number of pips matches. After each play, the player draws another bone from the boneyard (to keep number of bones at 5). Bones are placed lengthwise unless there is a double. A double can be placed at right angles giving two more possibilities for play. (see illustration below) If a player cannot place a bone, the turn passes to next person.



Play continues until the boneyard is empty and one player has used all of his/her bones or no one can play. Each player counts the number of pips left and the lowest score wins the round.

The 50-Point Game

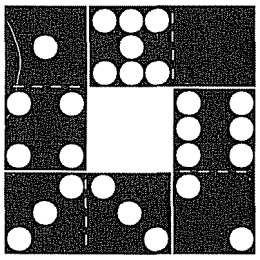
The game is the same as Pips with scoring added.

At the end of each round of Pips, the lead player lists the scores of each player. Rounds continue until a player has a total of 50 or more. The winner is the player with the lowest total.

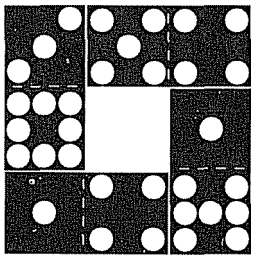
▲ Magical Squares Contest

This contest is open to any elementary school child (K-8). Deadline for entries is November 30, 2002. Send to Abacus editor at address on page 1.

Cut out the dominoes provided on page 8. Arrange the dominoes in magic squares (4 to a square) as shown below.



Sum each side = 8

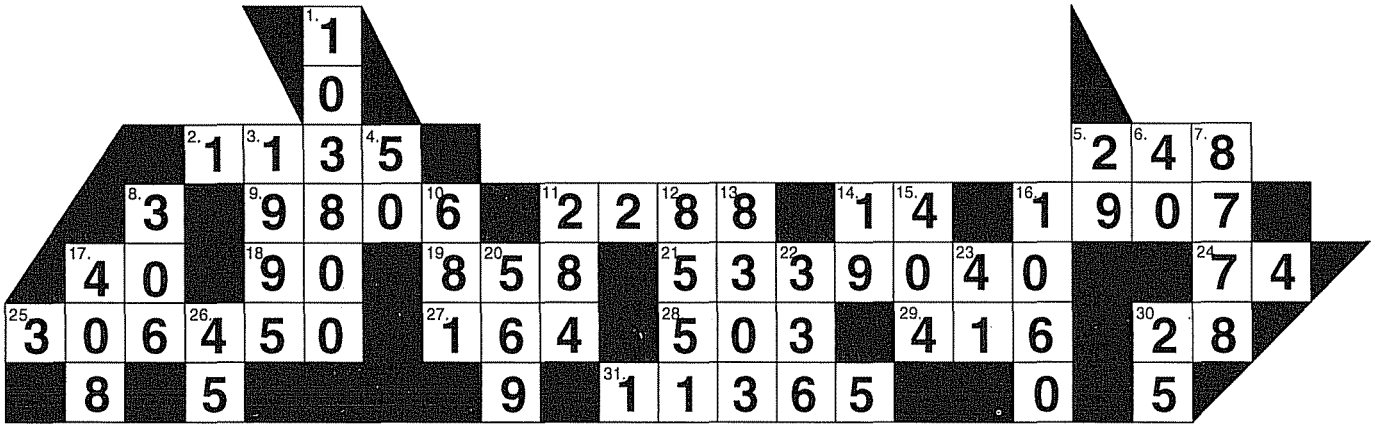


Sum each side = 12

The goal for each square is that the sides all total the same number as shown in the example. It is possible to make 14 squares with the 56 dominoes; however, submit your entry if you have at least 5 squares.

The grand prize will be a set of quality double nine dominoes. There will be runner-up prizes at the discretion of the editor.

▲ Ship Metric Puzzle - Answer Key



▲ *Century* Facts, Figures, and Store Supplies

(reprinted with permission from daily cruise newsletter provided to all guests)

The ship, *Century*, is owned by Celebrity Cruises and was built in Germany in 1995. Its principal cruising area is the Caribbean.

Ship's Specifications

Tonnage: 70 606
Length: 815 feet
Beam (width): 105 feet
Draft (depth): 25 feet
Speed: 22.3 knots
Decks: 14

Guest Capacity: 1750

Space ratio: 40

Crew size: 858 represents over 50 nations

Stateroom Accommodations:
Inside (no windows): 1 wheelchair accessible cabin and 305 twin suites.
Outside: 2 penthouse suites, 8 royal suites, 20 sky suites, 22 deluxe suites, 9 deluxe cabins, 7 deluxe wheelchair accessible cabins, and 501 twin suites.

Public Areas:
The *Hemisphere* area has capacity 447 people and the Sky Bar 188 people.

The *AquaSpa* is 10 053 square feet and in addition there are two outdoor swimming pools and four outdoor whirlpools. The *Veranda Grill* (two grills) seats 172 people while the *Islands Café* (four buffet lines) has seating for 638 people.

The *Celebrity Theatre* can accommodate 921 guests. *Michael's Club* has a maximum capacity of 45 people while *Images* can handle 140 people. *The Boulevard*, 1044 square feet, is a general socializing area. *Fortunes Casino*, 7539 square feet, can accommodate 265 people at any one time. *The Crystal Room* has 332 seats and the library can accommodate 30 people. Up to 50 people can gather in the *Card Room* and the *Cinema/Conference Centre* can accommodate 225 people. The restaurants: *Tastings* (74), *Rendez-Vous Square* (404) and the *Grande* (1060) provide more wonderful food for guests.

Store Supplies

These are the store supplies on *Century* for an average full house seven-day cruise.

The above figures include supplies used for cooking meals and baking. Note that the following is not a complete list.

21 600 pounds of beef	2500 pounds of potatoes
5040 pounds of lamb	16 800 pounds of fresh fruit
3360 pounds of pork	2500 gallons of milk
2520 pounds of veal	250 quarts of cream
1680 pounds of sausage	600 gallons of ice cream
4200 pounds of chicken	8650 dozen eggs
4200 pounds of turkey	4200 pounds of sugar
11 760 pounds of fish	2500 pounds of rice
675 pounds of crab	1500 pounds of cereal
3250 pounds of lobster	1650 pounds of coffee
21 500 pounds of fresh vegetables	1600 pounds of cookies
	42 000 tea bags

Conversion Chart *(not provided on fact sheet from ship)*

1 pound = 0.454 kg (1000 grams in 1 kilogram)

1 dozen = 12 items

1 gallon = 4.546 L (1000 ml in 1 litre)

1 quart = 1.137 L

1 nautical mile = 1852 metres

1 knot = 1 nautical mile per hour

1 ton = 907 kg

1 ton (cargo capacity of a ship) = 1.1 cubic metres

1 foot = 0.3048 m (100 cm = 1 metre)

▲ SHIP METRIC PUZZLE

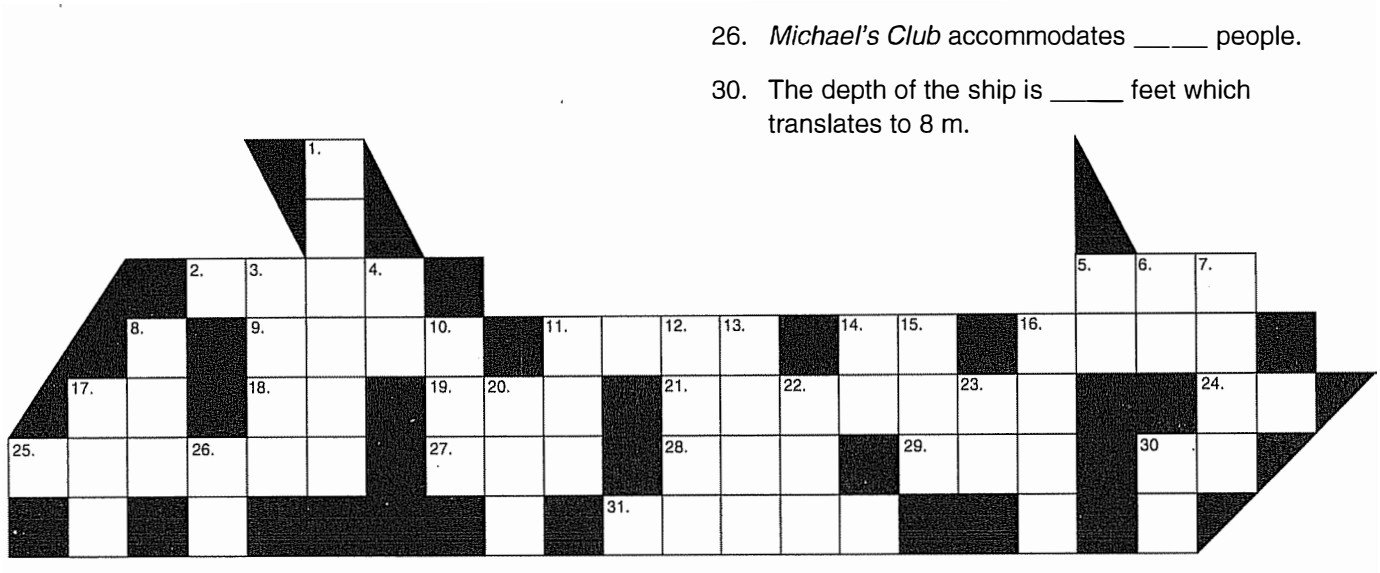
The clues are based on *Century* Facts and Figures Page. All numbers are to the nearest whole number.

Across

2. _____ kg of potatoes
5. Length of ship is _____ metres.
9. _____ kg of beef are in store supplies for one week.
11. _____ kg of lamb are eaten.
14. There are ___ decks on this ship.
16. _____ kg of chicken are prepared for meals.
17. The space ratio number for the ship is _____.
18. If one stateroom accommodates 2 people, then ____ people can stay in 45 staterooms.
19. There are _____ crew on the ship.
21. _____ grams of fish are consumed in one week.
24. The Tastings suite has seating for ____ guests.
25. Supplies include _____ grams of crab.
27. _____ grams in 0.164 kg.
28. 5 hundreds and 3 ones
29. This number has factors 32 and 13.
30. Total number of Royal and Sky suites.
31. The store supplies includes _____ litres of milk.

Down

1. _____ eggs are used in one week.
3. Year ship was built is _____.
4. At least _____ nations are represented on this ship.
5. 0.29 metres is _____ cm.
6. _____ eggs per person are used each week.
7. A palindromic number like 2002.
8. _____ inside cabins are available for guests.
10. ___ kg of cereal are available.
11. _____ litres of cream
12. This 4-digit number is divisible by 17.
13. This 4-digit number is divisible by 14 Down.
14. This is a 2-digit prime number whose digits add to 10.
15. *Rendez-vous Square* seats _____ people.
16. The *Grande Restaurant* seats _____ people.
17. _____ people on average eat lobster at 3.62 kg per person.
20. _____ outside cabins are available for guests.
22. This 3-digit number is divisible by 7.
23. The speed of the ship is ____ km/h.
26. *Michael's Club* accommodates _____ people.
30. The depth of the ship is _____ feet which translates to 8 m.



▲ The Wizardry of Secret Messages

Would you like to design your own secret codes? Here are some ideas from my collection.

To make a secret code you need to turn letters into numbers. Here is a suggestion.

A=1	B=2	C=3	D=4	E=5
F=6	G=7	H=8	I=9	J=10
K=11	L=12	M=13	N=14	O=15
P=16	Q=17	R=18	S=19	T=20
U=21	V=22	W=23	X=24	Y=25
Z=26				

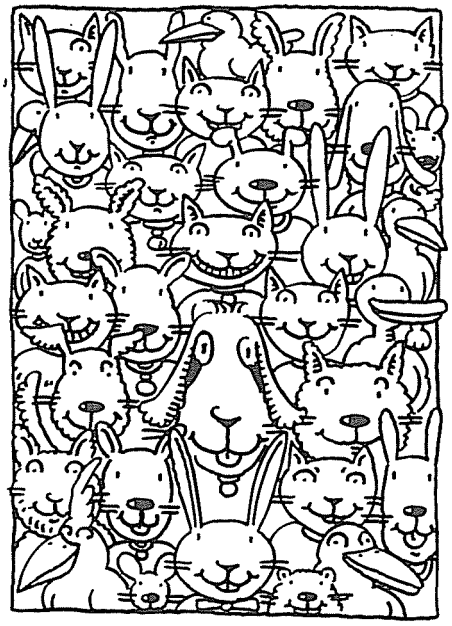
Try decoding this secret alphabet message:

1-18-9-20-8-13-5-20-9-3 21-19-5-19

2-5-1-4-19

6-15-18 3-15-21-14-20-9-14-7

Name Your Pet



My new pet (could be a cat or a dog) needs a name and I want to use number wizardry to find a special name. Here is an example and then you can create your own.

My birthday is May 9. In code that is 5-9 or EI. My pet arrived on November 13. In code that is 11-13 or KM.

I will name my pet Mike.

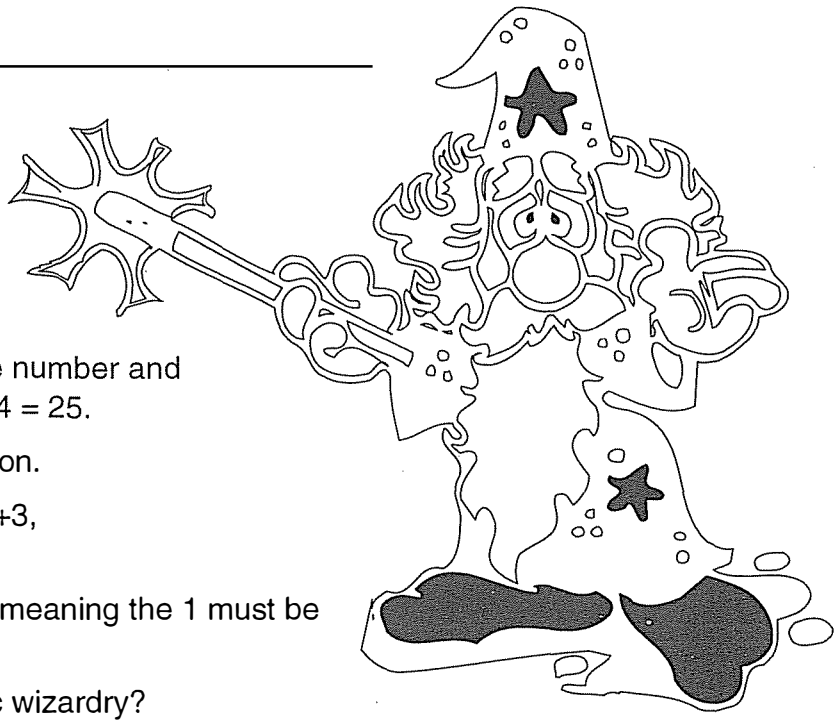
Wizardry in Arithmetic

- If the sum of the digits in a whole number is 3 or a multiple of 3, then the number is divisible by 3. Example: 7851 has sum of digits 21. 21 is divisible by 3 and so is 7851.
- To multiply by 25, add two zeroes to the number and divide by 4. This is the same as 100 ÷ 4 = 25.
- To multiply by 11, think digits with addition.

Examples: 23 x 11 = 2 __ 3. The __ is 2+3, thus 23 x 11 = 253.

59 x 11 = 5 __ 9. The __ is 5 + 9 = 14 meaning the 1 must be added to 5. The answer is 649.

Can you find other examples of arithmetic wizardry?



▲ Dominoes - Double 12 Set

Trim on black dashed line

