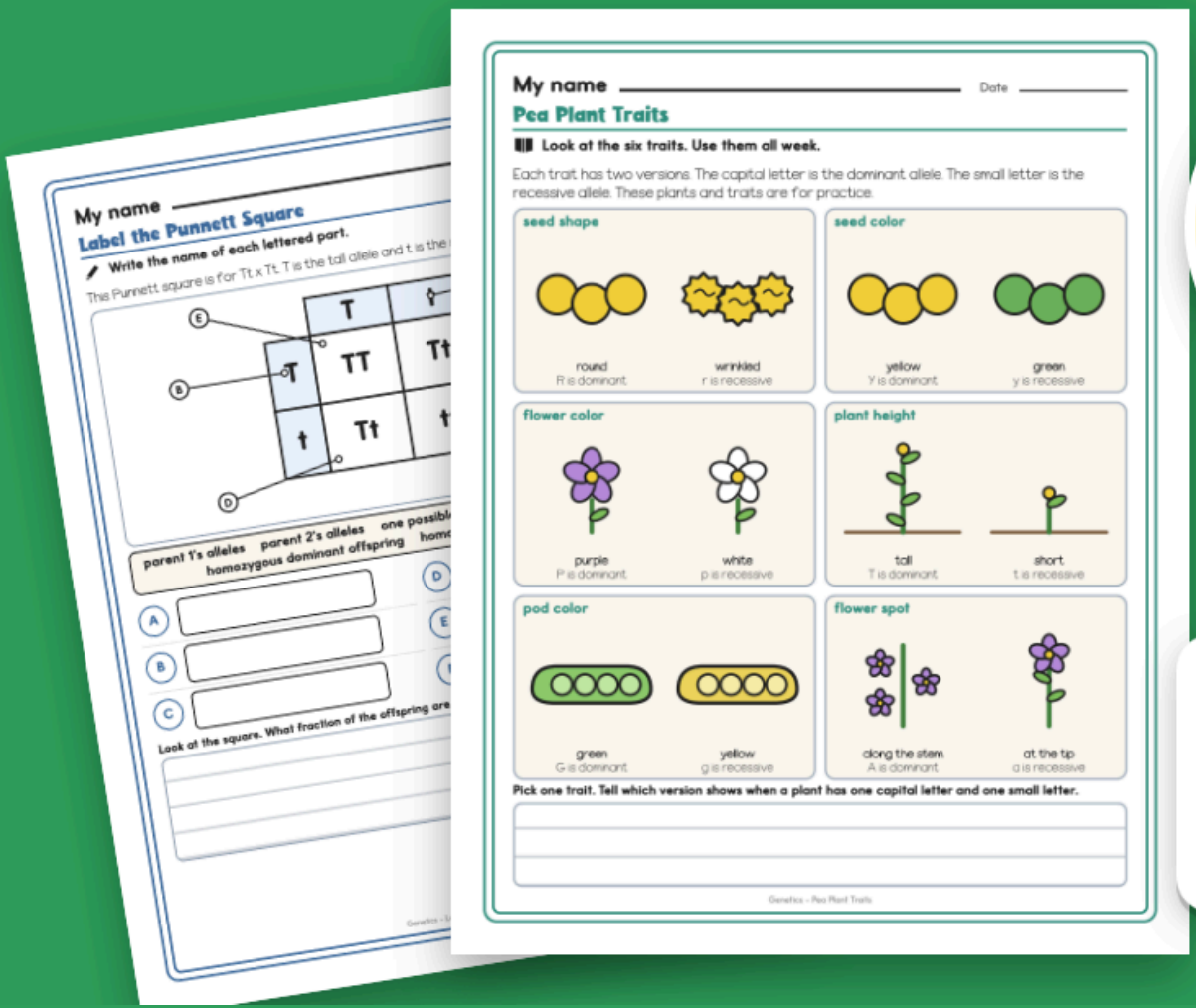
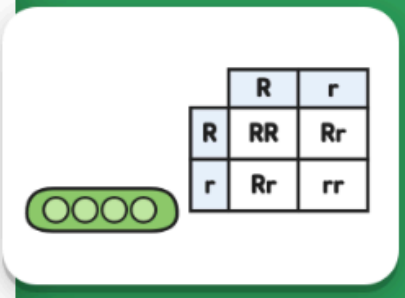
GENETICS & HEREDITY

TRAITS AND ALLELES
GRADES 6-8



20 STUDENT PAGES



Bright Path Sped

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This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or a box, type, and Save As.
- The name line, every answer box, every ruled work box and every check box on the student pages are type-in fields, and so are the tracker, class grid, team note and family page. You can also print any page and write by hand.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Every student page is black and white inside a colored border, so it still reads when copied in black and white.

Student work

A filled-in tracker, class grid or team note carries a real student's name. Keep it in the data folder, and use a first name only on any page that leaves your hands.

Need help?

If a field will not behave or a page will not print the way you expect, use Ask a Question on the product page before leaving a review. Every question is read, and a fix to the file ships as a free update: re-download it any time from My Purchases.

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PREVIEW

How To Read a Page

The parts of a student page, then the kinds of sheet in the order they come.

The parts of a page

- **The answer box.** A bordered box for a letter, a number or a genotype. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart for sentences. Write one idea to a line.
- **The check box.** True or false, same or mixed, or which parents: click or mark.
- **The word bank.** A box of words to use. Each word is used one time.
- **The cut line.** Twelve pieces in a 4 by 3 grid on each sort page, edge to edge: straight cuts only.

Kind of sheet	How many	What the student does
Readings and words	5 sheets	Read, match and keep the clue cards and the trait chart out.
Label, example, genotypes	3 sheets, 25 items	Name the parts of a square, follow one example, tie genotype to phenotype.
Punnett practice	3 sheets, 14 items	Fill squares, count offspring, find the parents.
Check and write	3 sheets	True or false, find Kit's mistakes, short answers.
Quizzes, exit tickets, sorts	12 items, 3 tickets, 24 pieces	Two quizzes, one exit sheet, two cut-and-sort pages.

PREVIEW

Untimed, unscored on the page

No student page has a timer or a score on it. The keys and the tracker are for you. The answer keys are on pages 25 to 28.

Short answers

Their key (page 27) says what to look for, not one right sentence. Accept any answer that uses a clue from the clue cards or the readings.

Printing and the type-in fields

Every page prints clean in black and white. The name line, every answer box, every ruled box and every check box are type-in fields in any PDF reader: click one, type, then save. This is a fillable PDF, not a slideshow or a word-processor file.

About Punnett squares

A Punnett square shows the chances for the offspring of two parents, not what will happen to any one plant. Every square here uses one gene with a dominant and a recessive allele.

Preview · Bright Path Sped

My name _____ Date _____

Reading 1: Traits and Genes

Read about traits. Then answer.

Traits and Genes

Look at a pea plant. Its flowers may be purple or white. Its seeds may be round or wrinkled. Each of these is a **trait**, a feature that can pass from parent plants to their offspring. Traits are guided by **genes**. A gene is a set of instructions inside a cell. In the 1860s a monk named Gregor Mendel grew thousands of pea plants in a garden and counted their traits. He found that the traits followed patterns. Every plant gets two copies of each gene, one from each parent plant. The two copies can be the same or different, and the pair decides which trait the plant shows.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. What is a trait?
   - **A** A tool used in a garden
   - **B** A feature that can pass from parent plants to offspring
   - **C** A plant that grows too tall

2. What is a gene?
   - **A** A set of instructions inside a cell
   - **B** A seed inside a pod
   - **C** A kind of flower

3. How many copies of each gene does a plant get?
   - **A** One, from only one parent plant
   - **B** Four, two from each parent plant
   - **C** Two, one from each parent plant

4. What did Gregor Mendel do?
   - **A** Grew pea plants and counted their traits
   - **B** Painted pea pods different colors
   - **C** Built a glass greenhouse

PREVIEW

My name _____ Date _____

Genetics Words

Match each word to what it means.

Write the letter of the meaning in the box. Use the readings to help you.

1	gene		A	An allele that shows only when two copies are there.
2	allele		B	A set of instructions for one trait.
3	dominant		C	The trait a plant shows, like purple flowers.
4	recessive		D	One version of a gene.
5	genotype		E	An allele that shows when even one copy is there.
6	phenotype		F	The pair of alleles a plant has, like Pp.

Use two of the words in one sentence about a pea plant.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Pea Plant Traits

Look at the six traits. Use them all week.

Each trait has two versions. The capital letter is the dominant allele. The small letter is the recessive allele. These plants and traits are for practice.

seed shape



round
R is dominant



wrinkled
r is recessive

seed color



yellow
Y is dominant



green
y is recessive

flower color

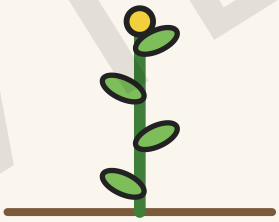


purple
P is dominant



white
p is recessive

plant height



tall
T is dominant



short
t is recessive

pod color

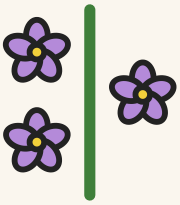


green
G is dominant



yellow
g is recessive

flower spot



along the stem
A is dominant



at the tip
a is recessive

Pick one trait. Tell which version shows when a plant has one capital letter and one small letter.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Worked Example: Punnett Square

Read the example. Then try one.

Example. The plants are made up for practice. Trait: seed shape. R is round (dominant) and r is wrinkled (recessive).

	R	r
r	Rr	rr
r	Rr	rr

Step 1

Write the parents' alleles.
Rr goes across the top. rr goes down the side.

Step 2

Fill each box.
Copy the letter above and the letter beside. Write the capital letter first.

Step 3

Count the offspring.
2 boxes are Rr (round seeds) and 2 boxes are rr (wrinkled seeds).

Your turn. Trait: seed color. Y is yellow (dominant) and y is green (recessive). Cross Yy x Yy.

	Y	y
Y		
y		

Boxes with Yy: ☐ **of 4**

Boxes with yy: ☐ **of 4**

Boxes with yellow seeds: ☐ **of 4**

PREVIEW

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My name _____ Date _____

Punnett Practice 1

Fill each square. Then count.

The capital letter is dominant. The top letters are the first parent. The side letters are the second parent. These plants are made up.

1 **Rr x Rr**

seed shape: R = round, r = wrinkled

	R	r
R		
r		

Children with wrinkled seeds: ☐ **of 4**

2 **Rr x rr**

seed shape: R = round, r = wrinkled

	R	r
r		
r		

Children with wrinkled seeds: ☐ **of 4**

3 **YY x yy**

seed color: Y = yellow, y = green

	Y	Y
y		
y		

Children with green seeds: ☐ **of 4**

4 **Tt x tt**

plant height: T = tall, t = short

	T	t
t		
t		

Children with short plants: ☐ **of 4**

Pick one cross. Tell why the count is not always the same.

PREVIEW

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My name _____ Date _____

Which Cross Made It?

Look at each square. Check the parents.

Each square is finished. Check the two parents that made it.

1 **plant height: T, t**

TT	Tt
Tt	tt

- ☐ Tt x tt
- ☐ Tt x Tt
- ☐ TT x tt

2 **flower color: P, p**

Pp	pp
Pp	pp

- ☐ Pp x pp
- ☐ Pp x Pp
- ☐ PP x pp

3 **seed shape: R, r**

Rr	Rr
Rr	Rr

- ☐ Rr x rr
- ☐ Rr x Rr
- ☐ RR x rr

4 **seed color: Y, y**

YY	YY
Yy	Yy

- ☐ Yy x Yy
- ☐ YY x Yy
- ☐ yy x yy

5 **pod color: G, g**

gg	gg
gg	gg

- ☐ Gg x gg
- ☐ Gg x Gg
- ☐ gg x gg

6 **flower spot: A, a**

AA	Aa
Aa	aa

- ☐ Aa x Aa
- ☐ AA x aa
- ☐ aa x aa

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Short Answers

Answer each question in sentences.

Use facts from the readings and the clue cards. Write in sentences.

1. Explain why a plant with the genotype Pp has purple flowers.

2. Two purple-flowered plants (Pp and Pp) have a white-flowered offspring. How can that be?

3. What does a Punnett square show? Use the words allele and offspring.

PREVIEW

My name _____ Date _____

Quiz A

Pick the best answer. Write its letter.

Take your time. Guess if you are not sure.

1. Which word means one version of a gene?
   - **A** allele
   - **B** trait
   - **C** genotype

2. T (tall) is dominant over t (short). What is the phenotype of Tt?
   - **A** short
   - **B** tall
   - **C** in between

3. Which genotype is homozygous recessive?
   - **A** Rr
   - **B** RR
   - **C** rr

4. How many boxes are in the Punnett square for Tt x Tt?
   - **A** 4
   - **B** 2
   - **C** 8

5. Parent 1 gives T and parent 2 gives t. What is the offspring genotype?
   - **A** TT
   - **B** Tt
   - **C** tt

6. Which describes a heterozygous plant?
   - **A** Two different alleles, like Yy
   - **B** Two matching alleles, like YY
   - **C** No alleles at all

PREVIEW

My name _____ Date _____

Exit Tickets

Answer each ticket before you go.

Each ticket takes about two minutes. Your teacher may collect them at the door.

1. Write a genotype for a plant with white flowers. P is the purple allele and p is the white allele.

2. Tell what a Punnett square shows in one sentence.

3. Say what dominant means in your own words.

PREVIEW

My name _____ Date _____

Cut and Sort 1: Dominant or Recessive

Cut out the twelve pieces. Paste each one in its box.

Dominant trait	Recessive trait

PREVIEW

Cut on the dashed lines: twelve pieces, two cuts across and three cuts down.

round seeds	wrinkled seeds	green seeds	purple flowers
short plants	green pods	white flowers	tall plants
yellow seeds	yellow pods	flowers along the stem	flowers at the tip

Answer Key: Readings, Words, Labels

Every letter is the position of the right option in the printed list.

Readings pages 5, 6

Item	Letter	Answer
5.1	B	A feature that can pass from parent plants to offspring
5.2	A	A set of instructions inside a cell
5.3	C	Two, one from each parent plant
5.4	A	Grew pea plants and counted their traits
6.1	A	A capital letter, like P
6.2	C	Purple
6.3	B	pp
6.4	C	What the plant looks like

Genetics Words page 7

Word	Letter	Meaning
1. gene	B	a set of instructions for one trait
2. allele	D	one version of a gene
3. dominant	E	an allele that shows when even one copy is there
4. recessive	A	an allele that shows only when two copies are there
5. genotype	F	the pair of alleles a plant has, like Pp
6. phenotype	C	the trait a plant shows, like purple flowers

Label the Punnett Square page 10

Letter	Name	How to tell
A	parent 1's alleles	the letters across the top
B	parent 2's alleles	the letters down the side
C	one possible offspring	one box in the square
D	heterozygous offspring	Tt, two different letters
E	homozygous dominant offspring	TT, two capital letters
F	homozygous recessive offspring	tt, two small letters

Genotype to Phenotype page 12

Genotype	Check	Looks like
1. RR	same	round seeds
2. rr	same	wrinkled seeds
3. Tt	mixed	tall plants
4. pp	same	white flowers
5. Yy	mixed	yellow seeds
6. GG	same	green pods
7. gg	same	yellow pods
8. Aa	mixed	flowers along the stem

PREVIEW

Answer Key: Parents, Checks, Writing

Accept any short answer that uses a clue from the readings or the clue cards.

Which Cross Made It? page 15

Item	Letter	Parents	Boxes
1	B	Tt x Tt	TT, Tt, Tt, tt
2	A	Pp x pp	Pp, pp, Pp, pp
3	C	RR x rr	Rr, Rr, Rr, Rr
4	B	YY x Yy	YY, YY, Yy, Yy
5	C	gg x gg	gg, gg, gg, gg
6	A	Aa x Aa	AA, Aa, Aa, aa

True or False page 16

Item	Answer	Fix
1	true	-
2	false	A plant gets one copy from each parent.
3	true	-
4	false	A recessive allele shows only when two copies are there.
5	true	-
6	false	Genotype is the pair of alleles. Phenotype is what the plant looks like.
7	true	-
8	false	Pp and Pp plants can have a pp offspring with white flowers.

Find the Mistake (Kit is invented) page 18

Item	What is wrong	Right way
1	Pp is the genotype. Purple flowers is the phenotype.	Pp is a genotype.
2	rr has no dominant allele, so the seeds are wrinkled.	A plant with rr has wrinkled seeds.
3	A recessive allele shows only when two copies are there.	A recessive allele shows only with two copies.
4	A Punnett square shows what can happen, not what will happen.	A Punnett square shows the chances.

Short Answers: look for page 17

Item	Question	Look for
1	Explain why a plant with the genotype Pp has purple flowers.	P is dominant, so one copy is enough to show purple; p is hidden.
2	Two purple-flowered plants (Pp and Pp) have a white-flowered offspring. How can that be?	Each parent passed on a p; the offspring is pp.
3	What does a Punnett square show? Use the words allele and offspring.	The possible offspring genotypes from two parents' alleles.

PREVIEW

Notes on this set

Write what the student said or did on the cross, true or false, mistake and writing pages.

Genetics Tracker

One student, every scored sheet. Filled example: page 33.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: Traits and Genes	4			
6	Reading 2: Alleles, Dominant and Recessive	4			
7	Genetics Words	6			
10	Label the Punnett Square	6			
11	Worked Example: Punnett Square	3			
12	Genotype to Phenotype	16			
13	Punnett Practice 1	4			
14	Punnett Practice 2	4			
15	Which Cross Made It?	6			
16	True or False	8			
19	Quiz A	6			
20	Quiz B	6			
23	Cut and Sort 1: Dominant or Recessive	12			
24	Cut and Sort 2: Same or Mixed Alleles	12			

How to fill this in

Write how many items the student got right with no prompt, and the date. A blank means not tried yet, never wrong. There are 97 items on the 14 scored sheets. Answer keys: pages 25 to 28. Filled example: page 33.

This month we are working on (your own standard or wording)

PREVIEW

Team Note

Use this page between team meetings or when a student moves classes, to hand off what changed without writing a note from scratch. Everything below is observable, with a blank for the number or the wording your team already uses.

Student _____ Team member _____ Date _____

Kind of sheet	Covered since last note (Y/N)	Items right	Still blank
Readings and words			
Label and worked example			
Genotypes			
Punnett squares			
Quizzes			
Cut and sort			

What I saw (observable, not a conclusion)

- Named ___ of 6 parts on the labeled Punnett square (page 10).
- Wrote ___ of 16 answers on genotype to phenotype (page 12).
- Counted ___ of 4 offspring correctly on Punnett Practice 1 (page 13).
- Explained in a complete sentence how two purple-flowered plants can have a white-flowered offspring: yes / no / with a reminder.

Next step

- Next page or set: ___, because ___ (what you saw).
- What to try in another class or at home: ___.
- What to keep doing because it is working: ___.
- Anything for the team meeting to decide: ___ (this page records what happened, never a label or a plan).

Summary, in one or two sentences, for whoever reads this next

A filled-in line, for reference

"Counted 3 of 4 offspring correctly on 9/22. Next step: redo the squares with the clue cards (page 8) and say which letters go across the top." That is the level of detail this page is built for. It matches the filled example on page 33.

PREVIEW

Jordan's Tracker (Invented Student)

Jordan P. is invented; nothing on this page describes a real student. The blank tracker is on page 29.

Student: Jordan P. (an invented student)

Teacher: Ms. Rivera (invented)

Month: September

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: Traits and Genes	4	4	9/8	-
6	Reading 2: Alleles, Dominant and Recessive	4	3	9/10	Mixed up dominant and recessive
7	Genetics Words	6	5	9/12	Swapped genotype and phenotype
10	Label the Punnett Square	6	-	-	-
11	Worked Example: Punnett Square	3	3	9/15	-
12	Genotype to Phenotype	16	13	9/17	Called Tt the same letters
13	Punnett Practice 1	4	3	9/22	Counted the wrong box
14	Punnett Practice 2	4	-	-	-
15	Which Cross Made It?	6	-	-	-
16	True or False	8	-	-	-
19	Quiz A	6	5	9/24	Missed which genotype is heterozygous
20	Quiz B	6	-	-	-
23	Cut and Sort 1: Dominant or Recessive	12	12	9/29	-
24	Cut and Sort 2: Same or Mixed Alleles	12	-	-	-

PREVIEW

How to read it

Jordan P. has done **8 of 14** scored sheets and got **48 of 55** items right with no prompt. **3** sheets were all right and **5** carry a note. Every number comes from the table.

What the table points to

The lowest sheets are Reading 2: Alleles, Dominant and Recessive (3 of 4) and Punnett Practice 1 (3 of 4). That is where the next practice goes. The 6 sheets left blank are not tried yet, never wrong.