LESSON MAKER PRO

Event Set Lab

Build events with or, and, and not.

HIGH SCHOOL · HSS-CP.A.1

CCSS.Math.Content.HSS-CP.A.1 "Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not")."

NAME _____ DATE _____

BUILD AN EVENT

Every event is a subset of the sample space, so list only outcomes that can happen. Use union for "or," intersection for "and," and a complement for "not"; "or" includes outcomes that are in both events.

WORKED EXAMPLE

A spinner has sample space S={circle, square, star, triangle}. Let A={circle, star} and B={star, triangle}. Find A and B.

1. A={circle, star}.
2. B={star, triangle}.
3. The only outcome in both sets is star.

Answer: A ∩ B={star}

PRACTICE 6 problems

1 A number cube has sample space S={1,2,3,4,5,6}. Write the event E that the outcome is greater than 3.

ANSWER _____

2 Let S={a,b,c,d,e,f}, A={a,c,e}, and B={b,c,d}. Find A or B.

ANSWER _____

3 Let S={10,11,12,13,14,15}, A={11,13,15}, and B={13,14,15}. Find A and B.

ANSWER _____

4 Let S={p,q,r,s,t,u} and D={q,s,u}. Write the event not D.

ANSWER _____

5 Let S={1,2,3,4,5,6,7,8,9}, P={3,6,9}, and Q={2,3,5,7}. Write the event "in P but not in Q" using set notation, then list its outcomes.

ANSWER _____

6 Let S={w,x,y,z}, C={w,x}, and D={x,z}. Find the event "not in C or in D."

ANSWER _____

APPLY IT Show your work

1 Student council will randomly choose one applicant from S={Ava, Ben, Carlos, Eli, Farah, Grace, Hana, Jay}. The applicants who play a school sport are A={Ava, Carlos, Eli, Grace}. The applicants in theater are T={Ben, Carlos, Farah, Grace}. Write the event that the chosen applicant plays a school sport or is in theater.

WORK SPACE

ANSWER _____

2 A gaming club will randomly select one game from S={Nova, Pixel, Quest, Rally, Summit, Tempo}. Strategy games are R={Nova, Quest, Summit}, and multiplayer games are M={Pixel, Quest, Rally}. Write the event that the selected game is neither a strategy game nor a multiplayer game.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Let S={1,2,3,4,5,6,7,8,9,10,11,12}, A={2,4,6,8,10,12}, and B={2,3,5,7,11}. An outcome passes a filter only if it is not in A and not in B. Write the event using A and B, list its outcomes, and explain why.

WORK SPACE AND ANSWER

ANSWER KEY

Event Set Lab

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A number cube has sample space S={1,2,3,4,5,6}. Write the event E that the outcome is greater than 3.	**E={4,5,6}**
2	Let S={a,b,c,d,e,f}, A={a,c,e}, and B={b,c,d}. Find A or B.	**$A \cup B$={a,b,c,d,e}**
3	Let S={10,11,12,13,14,15}, A={11,13,15}, and B={13,14,15}. Find A and B.	**$A \cap B$={13,15}**
4	Let S={p,q,r,s,t,u} and D={q,s,u}. Write the event not D.	**D^c={p,r,t}**
5	Let S={1,2,3,4,5,6,7,8,9}, P={3,6,9}, and Q={2,3,5,7}. Write the event "in P but not in Q" using set notation, then list its outcomes.	**$P \cap Q^c$={6,9}**
6	Let S={w,x,y,z}, C={w,x}, and D={x,z}. Find the event "not in C or in D."	**$C^c \cup D$={x,y,z}**

PART 2 · APPLY IT

1. **$A \cup T$={Ava, Ben, Carlos, Eli, Farah, Grace}** Take every applicant in A or T. Carlos and Grace are listed once because they belong to both events.
2. **$R^c \cap M^c$={Tempo}** First find the games in R or M, then remove them from S. The only game outside both sets is Tempo.

CHALLENGE

$A^c \cap B^c = (A \cup B)^c$={1,9}. An outcome must be outside both A and B, so remove every outcome in either set from S.

Accept set elements in any order. Accept equivalent notation such as "not A" for A^c and $(A \cup B)^c$ for $A^c \cap B^c$.