## **Shape Shifter: A Student Activity**

						-,	-		101	15, a	na	ιra	nsi	au	ons	01	two-	am	lens	5101	als	snaj	503			1	
1.	Us	e th	ne gi	raph	pap	er v	vert	ical	ly.	Plac	e th	e o	rigi	n ir	n the	e cer	nter.									POINT	ORDERE
2.	Lo	cate	e an	d lab	oel p	oin	ts A	-D:																	Ļ	TOINT	PAIR
3.	Co	nne	ect p	ooint	s AE	BCE	DA.	Wł	nati	is th	e na	ame	of	this	s sha	ape?	?									А	(-4, -2)
																								_		B	(-2,2)
4.	Ad	ld 1	0 to	eacl	n firs	st co	oor	dina	te a	and	5 to	eac	h s	eco	nd o	coor	dina	te to	get	$A_1$	- D1	. Lo	ocat	e ar	d -	<u> </u>	(1,2)
	cor	nne	ct tł	nese	new	po	ints	to	mal	ke a	con	gru	ent	sha	ape	to A	ABCE	).							1	D	(5,-2)
5.	Dra to 2	aw A1?	a st	raigł	nt ar	rov	v fro	om 4	A to	) A1.	W]	hat	is tl	he l	hori	zon	tal aı	nd v	ertio	cal d	lista	ince	fro	m A		POINT	ORDERE PAIR
																								_		A1	(6,3)
6.	Fro	om.	A –	D, a	dd 1	0 tc	ea	ch fi	rst	coo	din	ate	and	d sı	ıbtr	act 5	5 to e	ach	seco	ond	c00	rdir	nate	to		B1	( , )
	get	t A2	– L	)2. L	ocat	e ar	nd c	onr	lect	the	se n	ew	poi	nts	to r	nak	e a n	ew s	hap	e.						C1	( , )
_	-			. 1							<b>T</b> 1 <b>T</b>		1										~			D1	( , )
7.	Dra to 1	aw A2?	a st	raigł	nt ar	rov	v fro	om 4	A to	) A2.	WI	hat	is tl	he l	hori	zon	tal aı	nd v	ertio	cal d	lista	ince	fro	m A		POINT	ORDERE PAIR
8	W/ł	hat	tvn	e of 1	noti	0n -	will	me	ve	shar	ρ Δ	BC	Do	nto		B <sub>2</sub> C	2D22							-	Γ	A2	(6,-7)
5.		iut	γP			511	** 111			Jia					, 1 12	<u>.</u>									Ī	B2	( , )
9	Wł	hat	woi	uld v		t ol	o th	ne co	ore	dina	tes d	of A	B	C	and	1 D I	to tra	nsla	te s	han	e Al	вст	) 10	uni	ts [	C2	( , )
	tot	the	left	and	5 up	o? L	.oca	ite a	nd	con	nect	: the	ese i	nev	v co	ordi	inate	s A3	– D	3 <b>.</b>	C 1 1	UCL	, 10	un		D2	( , )
10	. Wł	hat	woi	uld y	ou c	lo t	o th	ne co	oor	dina	tes o	of A	, B,	, C,	and	l D I	to tra	nsla	te s	hap	e Al	BCE	0 10	_ uni	ts	POINT	ORDERE
		1																									
	to 1	tne	left	and	5 do	owr	ı? L	oca	te a	nd c	onn	nect	the	ese	new	7 COC	ordin	ates	A4 ·	- D4	•				Ì	Аз	( , )
	to		left	and	5 do	owr	1? L	ocat	te a	nd c	onn	nect	the	ese	new	7 COC	ordin	ates	A4 ·	– D4					F	A3 B3	( , ) ( , )
11.	to i . Wi	tho	left	and lraw	5 do ing i	owr	vh	ocat at w	te a	nd c ld be	onn e the	e ne	the w c	ese : :00:	new rdir	v coo nates	ordin s of t	ates ne v	A4 · ertic	– D4	if sh	nape	e AE	CD		A3 B3 C3	( , ) ( , ) ( , )
11.	to i . Wi wa	tho is m	left out c	and Iraw ed 8 i	5 do ing i units	owr 1 – 5 to	n? L wh the	ocat at w rig	te a roui ht a	nd c ld be and i	onn e the l2 u	e ne p. H	the ew c fill i	coo in t	new rdir able	ates A5	ordin s of t - D5	ates ne v with	A4 ertic yo	– D4 ces, : ur ai	if sł nsw	nape ver.	e AE	CD		A3 B3 C3 D3	( , ) ( , ) ( , ) ( , )
11. 12	. Wi wa . Wi wa	tho is m tho	ut c out c out c	and Iraw ed 8 1 Iraw ed 7 1	5 do ing i units ing i units	owr t – s to t - v s to	1? L wh the wha the	ocat at w rig at w left	te a roui ht a oul	nd c ld be and 1 ld be	onn e the l2 u e the dow	e ne p. F e ne vn. 1	the w c fill i w c Fill	coor in t	new rdir able rdin table	v coo nates e A5 ates e A6	ordin s of t - D5 s of tl - D6	ates ne vo with ne vo with	A4 ertic you ertic	– D4 ces, i ur a es, i ur a	if sł nsw f sh nsv	ape ver. ape ver.	e AE AB	CD		A3 B3 C3 D3 POINT	( , ) ( , ) ( , ) ( , ) ORDERE PAIR
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## **Shape Shifter: Student Activity Answers**

The purpose of this activity is for students to gain experience in the properties of orientation and congruence of rotations, reflections, and translations of two-dimensional shapes on a coordinate plane. 1. Use the graph paper vertically. Place the origin in the center. ORDERED POINT PAIR 2. Locate and label points A-D: А (-4,-2) 3. Connect points ABCDA. What is the name of this shape? В (-2,2) trapezoid С (1,2)4. Add 10 to each first coordinate and 5 to each second coordinate to get A1 - D1. Locate and D (5,-2) connect these new points to make a congruent shape to ABCDA. 5. Draw a straight arrow from A to A1. What is the horizontal and vertical distance from A ORDERED POINT to  $A_1$ ? PAIR *horizontal=10; vertical=5* A1 (6,3) 6. From A - D, add 10 to each first coordinate and subtract 5 to each second coordinate to **B**1 (8,7) get  $A_2 - D_2$ . Locate and connect these new points to make a new shape.  $C_1$ (11,7) D1 (15,3) 7. Draw a straight arrow from A to A<sub>2</sub>. What is the horizontal and vertical distance from A ORDERED to A<sub>2</sub>? POINT PAIR *horizontal=10; vertical=5* (6, -7)A2 8. What type of motion will move shape ABCD onto A2B2C2D2? (8,-3) translation B2 C2 (11, -3) 9. What would you do to the coordinates of A, B, C, and D to translate shape ABCD 10 units to the left and 5 up? Locate and connect these new coordinates A<sub>3</sub> – D<sub>3</sub>. D2 (15,-7) add -10 to 1<sup>st</sup> corrdinate and 5 to the 2<sup>nd</sup> coordinate ORDERED POINT 10. What would you do to the coordinates of A, B, C, and D to translate shape ABCD 10 units PAIR to the left and 5 down? Locate and connect these new coordinates A<sub>4</sub> – D<sub>4</sub>. Аз (-14,3) add -10 to 1st coordinate & subtract 5 from the 2nd coordinate Вз (-12,7) 11. Without drawing it – what would be the new coordinates of the vertices, if shape ABCD Сз (-9,7) was moved 8 units to the right and 12 up. Fill in table A<sub>5</sub> - D<sub>5</sub> with your answer. D3 (-5,3) 12. Without drawing it - what would be the new coordinates of the vertices, if shape ABCD ORDERED POINT was moved 7 units to the left and 9 down. Fill in table A6 - D6 with your answer. PAIR (-14,-7) A4 (-12,-3) B4  $C_4$ (-9, -3) (-5,-7) D4 B. B, С,  $C_1$ ORDERED POINT PAIR (4, 10)A5 (6,14) B5 D. В С D A C5 (9, 14)D5 (13,10) ORDERED D POINT A PAIR B. B C C (-11, -11)  $A_6$ (-9,-7) B6 C<sub>6</sub> (-6, -7) D6 (-2,-11) D A, D.