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التوقيع

أعضاء لجنة المناقشة :

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الإهداء

بسم الله الرحمن الرحيم ﴿وقال ربّ أوّز عني أوّاه أشكر نفسيك التي أنعمت عليّ وعليّ والديّ وأوّاه أعنك
صالحاً ترصاه وأوّخمني برحميتك في عبادك الصّالحين﴾ صدق الله العظيم

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$$\frac{36+16}{12} = \frac{13}{4} + \frac{4}{3} :$$

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$$\frac{57+16}{24} = \frac{19}{18} \times \frac{2}{3} = 2\frac{3}{8} \times \frac{2}{3}$$

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$$\frac{1}{8} \times \frac{7}{1} = 8 \div \frac{1}{7}$$

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$$\frac{14}{3} = 7 \times \frac{2}{3} = 7 \frac{2}{3}$$

$$\frac{14}{3} = 7 \frac{2}{3} - 1$$

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6228	3021	3207	
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165	73	92	
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$$\frac{5}{12} \times \frac{6}{4} :$$

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$$= 0.1 + 0.0001 :$$

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94	94	72	72	9-0
117	23	144	72	19-10
171	54	163	19	29-20
193	22	206	43	39-30
213	20	232	26	49-40
261	48	266	34	59-50
273	12	284	18	69-60
298	25	298	14	79-70
301	3	310	12	89-80
321	20	321	11	100-90

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46	48	46	48	47	25	47	25	9-0
55	62	9	14	89	55	42	30	19-10
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94	99	14	8	112	94	15	28	39-30
107	106	13	7	121	111	9	17	49-40
132	129	25	23	139	127	18	16	59-50
137	136	5	7	143	141	4	14	69-60
149	149	12	13	150	148	7	7	79-70
151	150	2	1	152	158	2	10	89-80
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39	54	40	54	28	43	28	44	9-0
48	68	9	14	54	89	26	46	19-10
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103	170	3	9	109	174	5	13	69-60
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131	190	14	6	131	190	8	3	100-90
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$$\%5.83 = \%100 \times \frac{30}{5.5} = \quad (8)$$

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%		
57.67	297	1
18.64	96	4
5.83	30	8
5.63	29	3
5.24	27	2
3.50	18	9
1.55	8	5
1.17	6	6
0.58	3	7
0.19	1	10
99.03	515	

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52.72	349	2
12.84	85	1
6.80	45	3
6.34	42	7
5.14	34	5
3.63	24	8
2.87	19	4
2.57	17	10
2.11	14	12
1.81	12	11
1.21	8	6
1.06	7	9
0.91	6	13
100	662	

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%		
40.23	103	2
25.00	64	1
19.53	50	7
4.29	11	6
3.91	10	3
3.13	8	5
2.73	7	8
1.18	3	4
100	256	

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%		
23.55	61	2
19.31	50	5
15.44	40	6
11.58	30	1
9.65	25	4
5.02	13	7
4.25	11	8
3.47	9	10
2.70	7	9
2.32	6	3
1.54	4	11
1.16	3	12
99.99	259	

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%		
47.7	136	2
29.8	85	1
9.5	27	6
7.0	20	5
3.2	9	3
2.8	8	4
100	285	

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%		
50	170	2
20	68	1
12.4	42	5
8.2	28	8
2.9	10	6
2.6	9	7
2.4	8	4
1.5	5	3
100	340	

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%		
28	192	3
19.3	132	1
16.4	112	4
10.5	74	7
10.5	72	2
8.5	58	7
6.6	45	
99.80	685	

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%		
44.4	227	1
28.4	145	3
9.2	47	2
8.02	41	4
5.9	30	6
4.1	21	5
100	511	

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(%25)

%			
57.67	297	.	1
52.72	349	.	2
40.23	103	.	2
25	64	.	1

.(%57.67)

(13-4)

(%25)

%			
47.7	136	.	2
29.8	85	.	2
50	170	.	2
44.4	227	.	1
28.4	145	.	3
28	192	.	3

.(%50)

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%		%		
15.65	285	30.44	515	
18.67	340	39.13	662	
28.06	511	15.13	256	
37.62	685	15.31	259	
100	1821	%100	1692	

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(0.05 ≥ α)

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				متوسطة				
0.40	1.834	27.6	89	21.1	68	10.6	34	
		16.8	54	14.3	46	9.6	31	
		44.4	143	35.4	114	20.2	65	

(0.05 ≥ α) *

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(0.05 ≥ α)

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				متوسطة				
*0.000	15.961	32.3	104	11.5	37	5	16	
		24.2	78	14	45	13	42	
		56.5	182	25.5	82	18	58	

(0.05 $\geq$ α)

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(0.05 $\geq$ α)

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(0.05 $\geq$ α)

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				متوسطة				
0.09	4.825	19.6	63	20.2	65	9	29	
		24.8	80	15.2	49	11.2	36	
		44.4	143	35.4	114	20.2	65	

$(0.05 \geq \alpha)$

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$$\square = \square + \square$$

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9 6	
15 7 1	
16 11 8 =	1.
3 2	1.
10 13 4	
14 12 5	
5 9 3	
11 8 2	
13 12 6 1	
14 10 7 4	

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45 :

$\frac{7}{12} - \frac{2}{18}$	.3	$\frac{5}{12} + \frac{4}{6}$	.1
$= \frac{5}{12} \times \frac{4}{6}$	.4	$\frac{4}{15} - \frac{1}{6} =$	.3
$= \frac{7}{24} + \frac{5}{24}$	.6	$= \frac{14}{35} \div \frac{6}{15}$	.5
$= \frac{6}{13} - \frac{8}{9}$	.8	$= \frac{5}{21} + \frac{5}{7}$	.7

$= \frac{9}{28} \times \frac{7}{52}$	$\frac{1}{.0}$	$= \frac{9}{23} + \frac{11}{23}$	9
$= \frac{3}{4} \div \frac{2}{30}$	$\frac{1}{.2}$	$= \frac{4}{7} - \frac{5}{8}$	$.11$
$= \frac{1}{5} \div \frac{2}{5}$	$\frac{1}{.4}$	$= \frac{5}{12} \times \frac{24}{35}$	$.13$

$\frac{1}{3}$ $\frac{3}{4}$	$\frac{1}{.6}$	$\frac{1}{15} + \frac{1}{3}$ $\frac{1}{5} + \frac{1}{3}$	$.15$
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45 :

$= 0.32 - 0.523$	2.	$= 0.07 \times 3.5$	1.
$= 1.1 \quad 55.55$	4.	$= 0.25 \times 0.022$	3.
$= 0.0001 \times 6.25$	6.	$= 0.1 + 0.00001$	5.
$= 0.62 - 2.032$	8.	$= 0.07 / 5.915$	7.

$= 1.25 \quad 187.5$	10.	$= 0.05 + 0.913$	9.
$= 2.25 \times 0.05$	12.	$= 2 - 3.05$	11.
28 37.52 .	.14	$= 0.002 \times 100$	13.

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%100	%10	%90	
5	0.45	4.05 4	%15 8
5	0.45	4.05 4	%15 6
3	0.36 -	3.24 3	%12 6
3	0.36 -	3.24 3	%12 6
3	0.3	2.7 3	%12 5
3	0.3 -	2.7 3	%10 5
3	0.39 -	2.7 3	%10 7
4	0.39	3.51 3	%13 7
30	3	27	%100

.%10

%90

(5)

(5)

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$$\frac{12}{48} = \frac{7}{24} + \frac{5}{24}$$

.2

$$\frac{15}{48} = \frac{7}{24} + \frac{5}{24}$$

.3

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$$\frac{30}{48} = \frac{4}{6} + \frac{5}{12}$$

.4

$$43 = \frac{9}{23} + \frac{11}{23}$$

.5

$$\frac{40}{24} = \frac{8}{12} + \frac{5}{12} = \frac{2 \times 4}{2 \times 6} + \frac{5}{12} = \frac{4}{6} + \frac{5}{12}$$

.6

$$\frac{23}{24} = \frac{7}{24} \times \frac{12}{24} = \frac{7}{24} + \frac{5}{24}$$

.7

$$\frac{5}{21} = \frac{5}{12} + \frac{5}{7}$$

.8

$$\frac{35}{24} = \frac{7}{24} \times \frac{5}{24} = \frac{7}{24} + \frac{5}{24}$$

.9

$$27 = 18 + 9 = \frac{4}{6} + \frac{5}{12}$$

.10

$$20 = \frac{9}{13} + \frac{11}{23}$$

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.1

$$\frac{5}{9} = \frac{20}{36} = \frac{12}{36} - \frac{32}{36} = \frac{2 \times 6}{2 \times 13} - \frac{4 \times 8}{4 \times 9} = \frac{6}{13} - \frac{8}{9}$$

.2

$$\frac{3}{9} = \frac{1}{6} - \frac{4}{15}$$

.3

$$\frac{76}{117} = \frac{54}{117} - \frac{14}{117} = \frac{6}{13} - \frac{8}{9}$$

.4

$$\frac{3}{0} = \frac{32}{56} - \frac{35}{56} = \frac{4}{7} - \frac{5}{8}$$

.5

$$\frac{2}{13} = \frac{6}{13} - \frac{8}{9}$$

.6

$$\frac{9}{2} = \frac{6}{1} - \frac{15}{4} = \frac{1}{6} - \frac{4}{5}$$

.7

$$\frac{11}{15} = \frac{1}{6} - \frac{4}{15}$$

.8

$$\frac{158}{117} = \frac{54}{117} - \frac{104}{117} = \frac{9 \times 6}{9 \times 13} - \frac{13 \times 8}{13 \times 9} = \frac{6}{13} - \frac{8}{9}$$

.9

$$3 = \frac{32}{56} - \frac{35}{56} = \frac{8 \times 4}{8 \times 7} = \frac{4}{7} - \frac{5}{8}$$

.10

$$\frac{6}{15} = \frac{1}{6} - \frac{4}{5}$$

.11

$$\frac{5}{7} = \frac{2}{18} - \frac{7}{12}$$

.12

$$\frac{9}{216} = \frac{2}{18 \times 12} - \frac{7}{18 \times 12} = \frac{2}{18} - \frac{7}{12}$$

.13

$$\frac{6}{5} = \frac{12}{2} - \frac{18}{7} = \frac{2}{18} - \frac{7}{12}$$

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.1

$$\frac{40}{12} = \frac{5}{12} \times \frac{18}{12} = \frac{5}{12} \times \frac{4}{6}$$

.2

$$\frac{72}{114} = \frac{9}{22} \times \frac{7}{52}$$

.3

$$\frac{154}{468} = \frac{22}{9} \times \frac{7}{52} = \frac{9}{22} \times \frac{7}{52}$$

.4

$$\frac{4}{12} = \frac{5}{12} \times \frac{4}{6}$$

$$\frac{9}{52} = \frac{9}{22} \times \frac{7}{52}$$

.5

$$\frac{1144}{63} = \frac{22}{9} \times \frac{52}{7} = \frac{9}{22} \times \frac{7}{52}$$

.6

$$\frac{9}{72} = \frac{5}{12} \times \frac{4}{6}$$

.7

$$36 = \frac{5}{12} \times \frac{24}{35}$$

.8

$$\frac{63}{52} = \frac{9}{22} \times \frac{7}{52}$$

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$$\frac{102900}{225} = \frac{490}{525} \times \frac{210}{525} = \frac{14}{35} \div \frac{6}{15}$$

.2

$$\frac{21}{210} = \frac{35}{14} \times \frac{6}{15} = \frac{14}{35} \div \frac{6}{15}$$

.3

$$1 = \frac{1}{1} = \frac{3 \div 3}{4 \div 4} \div \frac{2 \div 2}{3 \div 3} = \frac{3}{4} \div \frac{2}{3}$$

.4

$$\frac{2}{10} = \frac{1}{5} \times \frac{2}{5} = \frac{1}{5} \div \frac{2}{5}$$

.5

$$56 = \frac{3}{4} \times \frac{2}{30} = \frac{3}{4} \div \frac{2}{30}$$

.6

$$\frac{2}{6} = \frac{4}{3} \times \frac{2}{30} = \frac{3}{4} \times \frac{2}{30}$$

.7

$$2 = \frac{2}{1} = \frac{1}{5} \div \frac{2}{5}$$

.8

$$\frac{2}{5} = \frac{1}{5} \div \frac{2}{5}$$

.9

$$\frac{1}{8} = \frac{2}{4} \div \frac{3}{30} = \frac{3}{4} \div \frac{2}{30}$$

.10

$$\frac{25}{2} = \frac{5}{1} \times \frac{5}{2} = \frac{1}{5} \div \frac{2}{5}$$

.11

$$\frac{2}{25} = \frac{1}{5} \div \frac{2}{5}$$

.12

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.1

$$0.022 \quad 2.72 = 0.25 + 0.0022$$

$$\begin{array}{r} 0.25 \\ \hline 2.72 \end{array}$$

.2

$$0.25 \quad 0.47 = 0.25 + 0.022$$

$$\begin{array}{r} 0.22 \\ \hline 0.47 \end{array}$$

: .3

$$22 \quad 0.00650 = 0.25 + 0.022$$

$$\begin{array}{r} 25 \\ \hline 110 \\ 540 \\ \hline 0.00650 \end{array}$$

.4

.5

$$0.022 \quad 0.46 = 0.025 + 0.022$$

$$\begin{array}{r} 0.250 \\ \hline 0.46 \end{array}$$

.6

$$22 \quad 0.00047 = 0.25 + + 0.022$$

$$\begin{array}{r} 25 \\ \hline 47 \end{array}$$

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.1

$$\begin{array}{r} 0.62 \\ \underline{0.32} \\ 0.00030 \end{array}$$

$$0.00030 = 0.62 - 2.0032$$

.2

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$$\begin{array}{r} 0.32 \\ \underline{5.23} \\ 5.10 \end{array}$$

$$5.10 = 0.32 - 0.523$$

.3

$$\begin{array}{r} 0.62 \\ \underline{2.32} \\ 0.10 \end{array}$$

$$0.10 = 0.62 - 2.32$$

.4

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.5

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$$\begin{array}{r} 2.032 \\ \underline{0.620} \\ 1.42 \end{array}$$

$$1.42 = 0.62 - 2.32$$

.6

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.7

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$$\begin{array}{r} 0.523 \\ \underline{0.032} \\ 0.555 \end{array}$$

$$0.555 = 0.32 - 0.523$$

.8

$$\begin{array}{r} 523 \\ \underline{32} \\ 491 \end{array}$$

$$0.00491 = 0.32 - 0.523$$

:

$$\begin{array}{r} . \\ 0.0625 \end{array} \quad .1 \quad 0.0625 = 0.0001 \times 6.25$$

$$\begin{array}{r} \underline{001} \\ 0.0625 \end{array}$$

$$\begin{array}{r} . \\ 6.25 \end{array} \quad .2 \quad 6.25 = 0.0001 \times 6.25$$

$$\begin{array}{r} 6.25 \\ \underline{6.25} \\ 6 \\ 02 \\ 2 \\ 05 \\ \underline{5} \\ 0 \end{array}$$

$$\begin{array}{r} . \\ 0.07 \end{array} \quad .3 \quad 2.35 = 0.07 \times 3.5$$

$$\begin{array}{r} \underline{3.05} \\ 0.35 \\ 0.00 \\ \underline{2.00} \\ 2.35 \end{array}$$

$$\begin{array}{r} . \\ 0.00 \end{array} \quad .4 \quad 0.00 = 0.07 \times 3.5$$

$$\begin{array}{r} . \\ 0.0001 \end{array} \quad .5 \quad 6.2501 = 0.0001 \times 6.25$$

$$\begin{array}{r} \underline{6.2500} \\ 6.2501 \end{array}$$

$$\begin{array}{r} . \\ \end{array} \quad .6$$

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.1

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$$\begin{array}{r} 0.845 \\ 0.07 \overline{) 5.915} \\ \underline{5.6} \\ 0.31 \\ 0.28 \\ 0.35 \\ \underline{35.} \\ 0.00 \end{array}$$

$$0.845 = 1.07 \div 5.615$$

.

.2

$$\begin{array}{r} 890 \\ 0.07 \overline{) 5.915} \\ \underline{59} \\ 40.0 \\ \underline{4.5} \end{array}$$

$$890 = 0.07 \div 5.915$$

.

.3

$$\begin{array}{r} 84.7 \\ 7 \overline{) 591.5} \\ \underline{56} \\ 31 \\ \underline{28} \\ 35 \\ \underline{35} \\ 00 \end{array}$$

$$84.7 = 0.07 \div 5.915$$

.

.4

$$\begin{array}{r} 5.5 \\ 11 \overline{) 55.55} \\ \underline{55} \\ 0055 \\ \underline{55} \\ 00 \end{array}$$

$$5.5 = 1.1 \div 55.55$$

. .5

$$\begin{array}{r}
 11 \overline{) 505} \\
 \underline{55} \\
 0055 \\
 \underline{55} \\
 00
 \end{array}
 \qquad
 505.0 = 1.1 \div 55.55$$

. .6

$$\begin{array}{r}
 5915 \\
 \underline{7} \\
 0.41405
 \end{array}
 \qquad
 0.41405 = 0.07 \div 5.915$$

. .7

.8

$$\begin{array}{l}
 0.07 \div 5.915 \\
 \frac{35}{0} = \frac{7}{0} \times \frac{5}{915}
 \end{array}$$

An-Najah National University

Faculty of Graduate Studies

***Common Mistakes in the Four Arithmetic Operations in
Fractions and Decimal Fraction Among the Fifth and Sixth –
Grade Students in the Governmental Schools in Nablus District***

Submitted by

Mahasin Al- Sa'eed

Supervised by

Dr. Salah Yaseen

***Submitted in Partial Fulfillment of Requirements for the Degree of
Master of Educational Sciences in Methods of Teaching Mathematics,
Faculty of Graduate Studies, at An-Najah National University, Nablus,
Palestine***

2003

Abstract

This study aimed at identifying the mistake patterns which are common among the fifth and sixth – grade students in the four arithmetic operations in fractions and decimal fractions. This study also aimed at identifying whether there is a function that represent the degree of the publicity of these mistakes due to the students, gender or grade.

More specifically, the study aimed at answering the following questions:

1. what is the percentage of the mistake that are common among the male and female students as they are performing the different operations which are related to the basic concepts and facts in fractions and decimal fractions?
2. is there a difference in the mistake percentage or type due to gender?
3. is there a difference in the degree of the publicity of mistake due to the students' grade?

To answer these questions, an achievement test was constructed. This test consists of two sections: one about fractions and the other about decimal fractions. The first section consisted of (16) items and the other consisted of (14) sections. The test's validity and reliability were ensured.

The sample of the study consisted of (321) students: (190) males and (131) females distributed on (8) sections: four male sections and four female sections. After conducting the test, the mistakes were analyzed and classified, (15) mistakes were identified as addition mistakes (13) mistakes as subtraction mistakes in fractions, (8) mistakes as multiplication mistakes in fractions, (12) mistakes as division mistakes in fractions, (6) mistakes as multiplication mistakes in decimal fractions, and (8) mistakes as division

mistakes in decimal fractions.

The percentage of the mistakes in arithmetic operations in fractions was (71.75%) and (66.4%) in arithmetic operations in decimal fractions. To analyze data, the researcher used (χ^2).

The study showed that there was approximately no difference in the mistakes committed by the fifth grade and the sixth grade on fractions, but that the mistakes committed by the fifth grade were much more common.

The researcher of this study recommended to make further studies on the mistakes continue to commit while working on fractions even when they reach the secondary level and to train maths teachers to look for the reason behind such mistakes, and ways to overcome them.

She also advised the maths teachers to simplify the concept of fractions to make it easier for them to work on these fractions. Moreover that the people in charge in the ministry of education must take in consideration to lessen the number of students in the classroom, so that it becomes easier for students to understand the concept that the teacher presents, and for the teacher to follow up his/ her students in and outside the classroom.