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The Effect of Teaching Carried Out by Using Worksheets on the Algebraic Thinking Levels of Primary School 8th Grade Students

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Authors' contributions

This work was carried out in collaboration between all authors. Authors AŞÖ and SK designed the study, wrote the protocol and supervised the work. Authors AŞÖ and SK carried out all laboratories work and performed the statistical analysis. Author AŞÖ managed the analyses of the study. Author EB wrote the first draft of the manuscript. Author EB managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

The purpose of this research is to explore the effects of teaching by using mathematics worksheets to address the eighth grades students' algebraic thinking levels. The research was carried out according to the experimentation model that requires pre-tests and post-tests with both control and experimental groups. The test results were analyzed by applying correlation research techniques to sub problems which were determined according to purpose of the research. Research took place at

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Yalova Ziya Gökalp Primary School with sixty-three 8th grade students (30 controls and 33 experimental groups) between September 2009 and April 2010. In order to gather data, a test of algebraic thinking levels (twenty seven items and four levels) was used. The conclusion was drawn from the data obtained from the answers of the experimental and control group students to the 'Algebraic Thinking Level Identification Test' before and after implementation. According to posttest results, the teaching with mathematics worksheets was more effective on average than the traditional method but the pre-to-post test results between the control and experimental groups were not statistically significant. Our hypothesis that the worksheet approach to teaching algebra would be a better approach to teaching than more traditional methods was not proven. Further work is needed to train teachers in the use of the worksheet method may be needed to realize the potential of this approach.

Keywords: Problem solving; learning algebra; algebraic thinking levels; worksheets.

1. INTRODUCTION

One of the important fields of teaching Mathematics is Algebra. The students who learn arithmetic with numbers and geometry with figures lead into algebra by using letters. In algebra, as in arithmetic, it is necessary to think the usage of not only one or two numbers but all the numbers and number sets. For this reason it seems more abstract than arithmetic. Thus from the ages of 12-14 when algebra is learnt by students, the difficulties that students face with increase and this situation affects academic achievement and affective development of the students [1].

The difficulties about algebra and algebra problem solving cases are seen in various countries and also this difficulty is not only experienced at the primary school level but also it emerges at the secondary school and even at the university level. According to some studies carried out in our country, students have difficulties in understanding algebra although it constitutes a basis for the advanced topics of the mathematics and for this reason their mathematical achievements are decreasing [1]. The different studies carried out on this issue ascertained that even though some of the students solved problems including algebraic expressions by using arithmetic operations, they could not find the solutions of linear equations and they had certain difficulties in understanding algebraic expressions [2-4]. Middle school students should learn algebra for having proficiency regarding the representation of quantitative relations and for having mathematical thinking skills regarding patterns, functions and generalizations. Students deal with algebraic symbols more at 7th and 8th grades than other grade levels. Students should be competent with algebraic symbols regarding graphics, tables and verbal representations of numerical and quantitative relations; learn introductory meanings of variables (i.e., their different meanings and usages); learn to make correlations between linear functions and rate/proportion with the help of their experiences; and to discriminate between non-linear functions from linear functions. In addition to that, students at this level should recognize equation expressions and they should generalize them, solve linear equations and be able to use simple formulas. As a result of these learning objectives, it is important to understand how students solve algebra problems and how to improve their algebra competencies, which are stated in the primary school program and which are, therefore, very important for middle school students. Kaput (1999) stated the following suggestions for improvement of the algebraic concepts in teaching primary school mathematics programs: a) Starting at the early ages (in pieces, by constructing the knowledge acquired by students on their own; b) Connecting the things learnt in algebra with the learning of the other subjects (by expanding and implementing mathematical) knowledge); c) involving one or two different forms of thinking in algebra (by implementing mathematical knowledge); d) Constructing students' linguistic and cognitive powers which naturally exist as a basis (by thinking what they learnt and what exactly they know at the same time); e) Encouraging active learning and constructing correlations by studying more about feeling and understanding.

It is difficult to achieve but not impossible to establish a learning environment which allows us to implement activities stated in NCTM (2000) and to consider the suggestions of Kaput (1999) for the conditions needed to be effective in coping with the difficulties encountered in algebra and algebra problem solving. In education, the

quality of education is important to study. In this case, thinking about how to teach most effectively guides us to study our methodologies, and to develop new methods, techniques and materials for teaching. In accordance with this, it is necessary to use modern teaching methods rather than traditional methods (traditional method is teacher-centered method. Teachers are active. Students are passive. The teacher never use a material for teaching to subject. The method is the lectures. Only by solving questions in algebra teaching and explain the issue by introducing definitions) [5]. In recent years, 'worksheets' are accepted among the materials, which are used in modern teaching methods in teaching mathematics, largely because of the advantage of preparing them to make them suitable to the content and not having monotonous lessons [6]. The worksheets, which can be coloured with schemas, figures, and images that can be used in almost every lesson and also which motivate and amuse students with anecdotes and dialogues, are important in permanent and effective learning [7].

The worksheets are written documents, which involve instructive explanations about the activities that students will carry out while teaching any subject [8]. A worksheet is a material, which serves as a multi-purpose guide which shows the activities that the students will do in class. Another feature of worksheets is that they are materials which teachers and students can prepare on their own. By using such worksheets, the behaviouristic trend in primary school practice is replaced by a constructive approach to address the mathematics programs. If the worksheets are based on a constructive approach, the ways for accessing and finding information can be given to students through worksheets rather than directly transferring information to students. It can be said that worksheets are the papers which help students to correlate mathematics with daily life by showing the footprints of the mathematics subjects that are being taught, or will be taught, in daily life and the activities can help them to establish connections with other lessons while being visually supported. In addition to that worksheets should have a structure which fulfils the individual needs of the students, through providing guidance so students can discover information and be motivated to do so as they can be amused while thinking.

It is especially difficult to ensure that primary school students are willing to learn by motivating them and by keeping their attention for a long time. The cartoons, images, figures, explanations, problem solving processes and tables are important in terms of maintaining attention of the students on the lesson [9]. As a result of previous studies, we know that the worksheets; help teachers to determine the effectiveness of teaching and learning levels of students and to transfer the concept to students [10]; increase students' interests and make them responsible for their own learning; realize effective conceptual teaching by establishing necessary connections and structuring concepts in their minds; remove misconceptions and increase achievement; provide students with supports to remember the rules of algebra rather than rote learning [11]; ensure evaluation at the end of the teaching process [12]; make learning enjoyable and convert inferences into habits [13]; ensure for students to develop a positive attitude towards mathematics; and improve students' cognitive process skills [14].

It is important to determine the algebra thinking levels of primary students in terms of establishing teaching environments that will develop generalization of algebra skills, which is an important part of mathematics. Carrying out research about the implications of using a worksheets approach is important in terms of testing the effectiveness of this teaching method. Whether activities designed by using worksheets have an effect on students' problem solving skills in solving primary school 8^{th} grade students' algebra problems is the focus of this study. Our research questions are:

- Does the teaching carried out by using worksheets have an effect on the algebraic thinking levels of the primary school 8^{th} grade students?
- Is there a significant difference between the algebraic thinking levels of primary school 8^{th} grade experimental group students before and after implementation?

2. MATERIALS AND METHODS

In order to analyze the effect of teaching carried out with worksheets in this study on the solving algebraic problems in primary school mathematics lessons, a quasi-experimental model with pre-test/post-test control group methodology was used. The experimental and control groups in the study were composed of two groups which were randomly selected from 8^{th} grades in the implementation school. In the

control group, the teaching was carried out with traditional methods and in the experimental group; the teaching was carried out with worksheets. It is assumed that using these worksheets will remove the instructional disadvantage of students in having a new teacher and save planning time by having the mathematics teacher of the primary school carry out the teaching activities both in experimental and control groups. The worksheets that would be used in experimental group were prepared by the researcher and submitted to the course teacher. These worksheets had the following characteristics:

- They were interactive;
- There were engaged on a computer;
- Each worksheet was colourful and cartooned; and
- Worksheets guided students through real life problems that could be solved using algebra.

2.1 The Sample of the Study

The selection of students who composed the sample for the study was specific to this school to allow the researcher to meet with the implementation teacher frequently. These meetings could minimize potential problems during the study; also this arrangement provided ease of transportation for the researcher to the implementation school. For this reason, it was decided to have the implementation school in the city of Yalova.

The 8th grade students in Yalova were selected as the participants of the study; 63 students were involved in the study; Ziya Gökalp primary school in this city was accepted as the implementation school for conducting worksheets. The 8-C and 8-D classes of the implementation school provided all participants for the study.

2.2 Data Collection Instruments

2.2.1 Algebraic thinking level identification test

In order to determine the students' Algebraic thinking levels, an algebra test, which was created by Hart, Kuchemann and Ruddock in 1998 for identifying the algebraic thinking levels of the students by CSMS "Concepts in Secondary Mathematics and Science" in England, was used (Altun, 2008). The algebra test is composed of 27 questions, which are divided into four groups. The questions are testing the four algebraic thinking levels of the students:

> In Level-1, there are questions about finding the value of a letter as a result of an arithmetic operation;
> In Level-2, more complicated questions than the first level but which are the same as the first level questions in terms of abstraction;
> In Level-3, questions about understanding and using letters as the unknown; and
> In Level-4, questions involving more complicated generalizations but similar to the expressions used in the third level.

In order to identify the algebraic thinking level of the students who took the test, the students were asked to answer at least four of the questions (67%) stated in Level-1, five of the questions (73%) in Level-2, five questions (63%) in Level-3 and at least six of the questions (83%) in Level 4. The levels of the students were identified according to this criterion, a student who cannot answer questions at the desired level cannot move into the next level.

Before teaching activities which were carried out with experimental group students by using 'worksheets' and with control group students by using traditional teaching methods, the algebraic thinking levels of these students were identified. This analysis included whether there was a difference between current algebraic thinking levels of the experimental and control group. For this purpose, first of all, the compliance of the algebraic thinking level test scores of experimental and control group students to the normal distribution was tested. In order to test the compliance to the normal distribution, Kolmogorov-Simirnov and Shapiro-Wilk tests were used and the test results are displayed in Table 2.

When the test results displayed in Table 2 are analyzed, it is seen that p significance value obtained from the algebraic thinking test scores of the students in 8-D (Experimental) and 8-C (Control) groups before implementation are greater than 0,05 significance level. According to these results, the control and experimental groups' pre-test scores on the algebra thinking level test show a normal distribution [for experimental group t(33)=0,29 p=0,08>0,05 and for control group t(30)=0,21 p=0,14>0,05 (Kolmogorov.simirnov)] and [for experimental

group t(33)=0,86 p=0,65>0,05 and for control group t(30)=0,83 p=0,60>0,05 (Shapiro.wilk)].

This result shows that the normality hypothesis which is necessary for using t and F statistics obtained from pre-tests was ensured. Before teaching activities, independent group t-tests were used for analyzing the differentiation between algebraic thinking level test scores of the control and experimental group students and test results are displayed in Table 3.

About the equality of the experimental and control groups' variances, the Levene Test for statistics was calculated as (F) 0,44 and the p significance level as 0,50. These results show that variances in pre-test scores were comparable in the two groups. In addition to that, by looking at the values displayed in Table 3, although it is seen that there is a significant difference between the 'Algebraic Thinking Level Test' average scores of experimental and control group students (Xexperimental=2,54>Xcontrol=2,33), this difference was not statistically significant (t(61)=0,85 p=0,39>0,05). These results show that there is not a significant difference between algebraic thinking levels of control and experimental group students before implementation. For this reason, 8-D and 8-C classes were determined as valid sample groups for comparing the effects of worksheets on their algebraic thinking levels.

After implementation, the 'Algebraic Thinking Level Test' was carried out as a post-test with both experimental and control groups. Since the compliance of post-test data to a normal distribution situation affects the method that will be followed for testing, and explain the probable difference that can occur after teaching activities, first the normality of the post-test data was analyzed and the results of the Kolmogorov-Simirnov ve Shapiro-Wilk tests regarding post-test data were displayed in Table 4.

Table 1. The number of students participating in this study

	F	%	M	%	T/%
8-C/Control	14	46.7	16	53.3	30(47.6)
8-D/Experimental	15	45.5	18	54.5	33(52.4)
Total	29	46	34	54	63(100)

Table 2. Kolmogorov-simirnov ve shapiro-wilk test results regarding pre-test scores of experimental and control groups that they obtained from algebraic thinking level test

Grade level	Group	Kolmogorov.simirnov			Shapiro.wilk		
		N	T	P	N	T	p
8D	Experimental	33	0.29	0.08	33	0.86	0.65
8C	Control	30	0.21	0.14	30	0.83	0.60

Table 3. Independent samples t-test results regarding pre-test scores of control and experimental groups obtained from the algebraic thinking level test

Grade level	Group	N	X	ss	t	p
8D	Experimental	33	2.54	0.93	0.85	0.39
8C	Control	30	2.33	1.02		

Table 4. Kolmogorov-simirnov ve shapiro-wilk test results regarding post-test scores of experimental and control group students that were obtained from algebraic thinking level test

Grade level	Group	Kolmogorov.simirnov			Shapiro.wilk		
		N	T	P	N	T	p
8D	Experimental	33	0.14	0.42	33	0.66	0.40
8C	Control	30	0.11	0.38	30	0.73	0.34

When the test results displayed in Table 4 are analyzed, it is seen that all the p significance values of the 'Algebraic Thinking Level Identification Test' scores of experimental and control students after implementation are bigger than 0,05 significance level [for experimental group t(33)=0,14 p=0,42>0,05 and for control group t(30)=0,11 p=0,38>0,05 (Kolmogorov.simirnov)] and [for experimental group t(33)=0,66 p=0,40>0,05 and for control group t(30)=0,73 p=0,34>0,05 (Shapiro.wilk)]. It can be stated according to these results that algebraic thinking level post-test scores of experimental and control groups show a normal distribution. This result shows that the necessary normality hypothesis was ensured for using t and F statistics in the analysis of the data collected from post-tests.

After teaching activities, a dependent group t-test was used for determining the effect of traditional teaching methods on algebraic thinking levels for the control group of students and test results were displayed in Table 5.

By looking at the data displayed in Table 5, it is seen that there is a 0,89-point difference between the pre-test and post-test scores of the control group students in the 'Algebraic Thinking Level Identification Test' (Xpost- test=3,20>Xpre-test=2,33) and the results show that this difference is statistically significant (t(29)=-4,29 and p=0,00<0,05). These results indicate that there is a significant difference between algebraic thinking levels of control group students before and after implementation and this difference has a tendency to increase. It can be said from here that the traditional teaching implemented in the control group increased algebraic thinking levels of students.

After teaching activities, dependent groups t-test was used for determining the effect of teaching with worksheets on the algebraic thinking levels of experimental group students and the results were displayed in Table 6. These results became an answer for the second research question of the study.

By looking at the values displayed in Table 6, it is seen that a 0,42-point difference occurred between 'Algebraic Thinking Level Identification' pre-test and post-test average scores of experimental group students (Xpost-test=3,36>Xpre- test=2,54) and these results indicate that this difference is statistically significant (t(32)=-3,96 ve p=0,00<0,05). These results indicate that a significant difference occurred between algebraic thinking levels of experimental group students before and after implementation and this difference has a positive tendency. For this reason, it can be said there is a significant difference between pre-test and post-test achievement scores of primary school 8th grade experimental group students. In other words, the teaching activities, which are supported by worksheets, increased the algebraic thinking levels of experimental group students. implementation?' was searched and the post-test scores of experimental and control group Independent group t-test scores were then calculated to compare the progress made between the control group and the experimental group. T-test results are displayed in Table 7.

Table 5. Dependent sample t-test results regarding pre-test and post-test scores which control group students obtained from the algebraic thinking level identification test

Groups	Test	N	X	ss	t	p
Control	Pre-test	30	2.33	1.02	-4.29	0.00
Control	Post-test	30	3.20	1.06		

Table 6. Dependent samples t-test results regarding the pre-test and post-test scores of experimental group students from algebraic thinking level identification test

Groups	Test	N	X	ss	t	p
Experimental	Pre-test	33	2.54	0.93	-3.96	0.00
Experimental	Post-test	33	3.36	0.99		

Table 7. Independent samples t-test results regarding post-test scores that control and experimental group students obtained from the algebraic thinking level identification test

Group	Test	N	X	ss	t	p
8-D	Experimental	33	3.36	0.99	0.63	0.53
8-C	Control	30	3.20	1.06		

About the equality of the experimental and control groups' variances, Levene Test statistics were calculated as (F) 0,20 and the significance level (p) as 0,65. These results show the group variances. In addition to that, by looking at the values displayed in Table 7, it can be said that although there is a 0, 16-point difference in favour of experimental group between 'Algebraic Thinking Levels Identification' when post-test average scores of the experimental and control group students are compared (Xexperimental=3, 36>Xcontrol=3, 20), this difference is not statistically significant (t (61) = 0, 63 and p=0, 53<0, 05). These results show that there is not a significant difference between algebraic thinking levels of control and experimental group students after implementation. The fact that the equality before teaching activities in algebraic thinking levels of control and experimental group students (Table 7) did not change after the implementation made us think that traditional teaching and teaching with worksheets are not different in terms of their effects on algebraic thinking levels. In conclusion, we found that teaching based on worksheets and traditional teaching equally affected the algebraic thinking levels of the students.

3. RESULTS AND DISCUSSION

The conclusion was composed of the data obtained from the answers of the experimental and control group students to the 'Algebraic Thinking Level Identification Test' before and after implementation.

It is seen that the average pre-test score of the control group students in 'Algebraic Thinking Level Test' significantly increased after teaching activities. This result showed that traditional teaching method increased algebraic thinking levels of primary school 8th grade students.

It is also seen that the average pre-test scores of experimental group students in 'Algebraic Thinking Level Test' significantly increased after teaching activities. This result showed that teaching based on worksheets increased algebraic thinking levels of students.

The post-test average score obtained from the algebraic thinking level test showed that after teaching activities, experimental group students were more successful than control group students. The algebraic thinking levels of experimental and control groups, which were equal before teaching activities, did not differ after implementation. In conclusion, although it is thought that teaching supported by worksheets and traditional teaching methods generated significant increases in algebraic thinking levels of students, it is seen that teaching methods used did not differ in terms of their effect on algebraic thinking levels. This result and the ones obtained in Yağdıran's (2005) postgraduate study support each other. The differentiation cases occurred in algebraic thinking levels of 8th grade students according to teaching methods were summarized in Fig. 1.

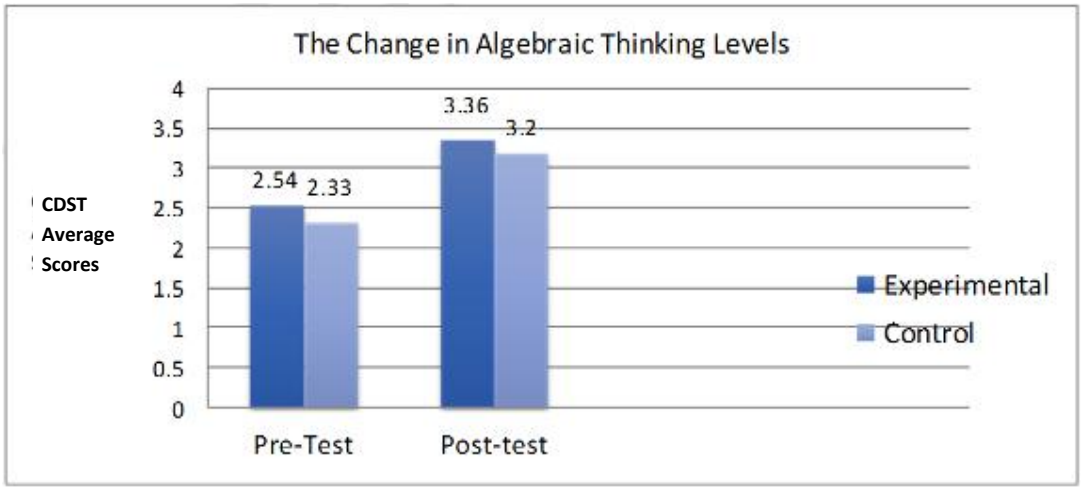

Fig. 1. The change in algebraic thinking levels

By looking at the values stated in this graphic, the following results were obtained after this study:

> The teaching carried out by using worksheets significantly increased algebraic thinking levels of 8th grade students; however, there was a comparable increase in the control groups learning from pre-to post-test and the differences in final achievement were not significant.

4. CONCLUSION

Teaching by using worksheets and traditional teaching did not create any significant difference in learning in favour of one approach.

It is necessary to extend the studies about developing worksheets which teachers mostly need in teaching of all subjects rather than specific topics of mathematics for creating an effective learning environment. Using this kind material consistently in mathematics lessons may affect students' achievement and their attitudes towards mathematics positively as stated by White and Gunstone [15].

Providing in-service training courses for teachers and providing practice with developing worksheets may increase teachers' competence when using them to support algebraic studies and thereby may influence the effectiveness of this approach to teaching.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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WORKSHEETS

ÇALIŞMA YAPRAĞI-1 DENKLEMİMİ DENKLEŞTİR - ÇÖZÜMÜ

Mert'e babası, yeni taşındıkları apartmandaki komşularını tanıtmaktadır. Babası bir takım ipuçları vererek yardımcı oluyor. Mert aşağıdaki tabloyu oluşturarak komşularını tanımaya çalışıyor. Bizde ona yardımcı olalım. Sizden istenen denklemleri oluşturmak. Denklem çözümlerini de bırakalım Mert yapsın değil mi?

Esma Hanım'ın kişi sayısı, Ahmet Bey'in çocuk sayısı ve Cengiz Bey'in daire numarası tabloda verilmiştir. Ayrıca size örnek olarak Ahmet Bey'in ailesindeki kişi sayısını veren denklem yazılmış... Buna göre verilen bilgileri kullanarak komşuların kişi ve çocuk sayısı ile daire numaralarını veren **denklemleri** tabloya yazın... Hadi bakalım kolay gelsin...

Komşular	Kişi Sayısı	Çocuk Sayısı	Daire No
Esma	**a**		
Büşra			
Cengiz			**c**
Ahmet	$\frac{a+3}{2}$	**b**	

- Esma Hanım 5 kişilik bir ailede yaşamaktadır. Ahmet Bey'in ailesinin kişi sayısı bu sayının 3 fazlasının yarısı iken Büşra Hanım'ın ailesinin kişi sayısı bu sayının 2 katından 4 eksiktir. Cengiz Bey'in ailesinin kişi sayısı da Esma Hanım 'ın ailesinin sayısının bir eksiğidir.
- Ahmet Bey'in çocuk sayısı en küçük pozitif asal sayıdır. Esma Hanım'ın çocuk sayısı bu sayının 4 fazlasının yarısıdır. Büşra Hanım'ın da, Ahmet Bey'in çocuk sayısının 2 katı kadar çocuğu vardır. Cengiz Bey de Büşra Hanım'ın çocuk sayısının 2 katının 6 eksiği kadar çocuğa sahiptir.
- Cengiz Bey'in daire no'su 4'tür. Esma Hanım'ın daire no'su bu sayının yarısından 1 eksiktir. Ahmet Bey'in daire no'su ise Cengiz Bey'in daire no'sunun 1 eksiğinin 2 katıdır. Büşra Hanım da Ahmet Bey'in daire no'sunun 2 katından 2 eksik olan dairede oturmaktadır.

ÇALIŞMA YAPRAĞI-2 BASKET NUMARASI

Basketbol takımı kuran 6 arkadaş forma numaraları için, 6 zarftan birini seçiyorlar. Bu zarfların içinde çözülmesi gereken denklemler bulunuyor. Denklemlerin çözüm kümesi ise forma numaralarını gösteriyor. Buna göre 6 kişinin hangi forma numaralarına sahip olduklarını bulun...

4. Zarf: $\frac{1}{r} + \frac{2}{r-3} = 0$

5. Zarf: $3x + \frac{1}{2}(5x - 3) = \frac{19}{2}$

6. Zarf: $\frac{x+2}{2} - \frac{x-3}{3} = 4$

Mehmet	Naz	Ahmet	Kubilay	Mete	Efe

1.zarf	2.zarf	3.zarf	4.zarf	5.zarf	6.zarf
					
Mehmet	Naz	Ahmet	Kubilay	Mete	Efe

1. Zarf: $\frac{1}{x}(x + 12) = 3$

2. Zarf: $5 + \frac{3}{x} = \frac{5x+3}{2x-8}$

3. Zarf: $\frac{5x-4}{2x} - \frac{4}{x} = 1$

ÇALIŞMA YAPRAĞI-3 ŞAİRİM, ŞAHANEYİM

DENKLEMİN KIYAFETLERİ

Pantolonum kareli
Gömleğim boyuna çizgili
Pantolonla gömlek fiyatım belli
İkisini de alsan ödersin yüzeli
Gel vatandaş gel
İkisini de alsan olmam engel
Kazaktan 20L fazladır ceket
Al ikisini yüze, parana gelsin bereket
Kalite ve ucuzluk burada
İki mont alana bir mont bedava
Üç montu veririm doksan liraya
Bunu da beğenmezsen derim sana elveda...

Yukarıdaki şiirde denklemleri bulup yazınız. Varsa çözümlerini yapınız...

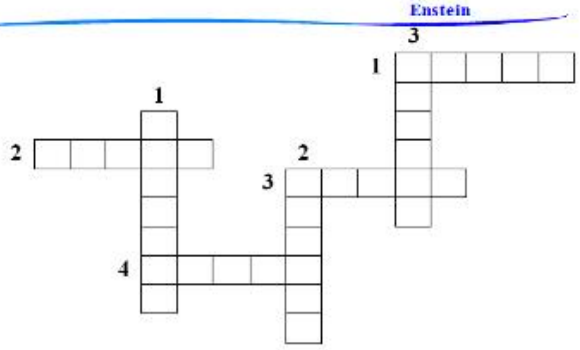
Denklemler ve Çözümleri:

Sizin şiirinizde kaç tane denklem olacak? Yazalım bulalım...

ÇALIŞMA YAPRAĞI-4 DENKBUL

Ben bir problemi en az 1 saatte çözerim. İlk 45 dakikada düşünürüm, 14 dakika beklerim.
Son dakikada da birden ve tam olarak çözümü sunarım.

Enstein



SOLDAN SAĞA

1. Elif'in cevizlerinin yarısının 6 fazlası, ceviz sayısının iki katıdır. Elif'in kaç cevizi vardır?
2. Biri diğerinin iki katına eşit olan iki sayının toplamı 6 ise küçük sayı kaçtır?
3. Kazağın fiyatı 2 TL daha ucuz olsaydı gömlekle aynı fiyatta olacaktı. Kazak ve gömleğin fiyatları toplamı 18 TL ise gömlek kaç TL'dir?
4. Berabere biten bir maçta bir gol daha atılsaydı, maçta atılan toplam gol sayısı 3 olacaktı. Buna göre takımlar kaç gol atmıştır?

YUKARIDAN AŞAĞIYA

1. Çocuğundan 21 yaş büyük olan anne çocuğunun 4 katı yaşındadır. Çocuk kaç yaşındadır?
2. Hangi sayının 3 fazlasının $\frac{2}{3}$ ü 8 eder?
3. Hangi sayının 2 eksiğinin 3 katı, aynı sayının iki katına eşittir?

1	2	3	4	5	6	7	8	9
								

Bilinmeyen değere karşılık gelen meyvelerin isimlerini bulmacada, kuralına göre yerine yazın...

ÇALIŞMA YAPRAĞI-5 SEN NE DERSİN?

1. Bir mağaza sahibi, mağazadaki malların sayımını yaptığında eteklerin sayısı pantolonların sayısının 3 katından 25 eksiktir. Mağazada etek ve pantolonların toplam sayısı 35' tir. Pantolon sayısı nedir?

2. İki sayının toplamı 170'tir.Büyük sayı, küçük sayının 3 katından 30 eksiktir. Küçük sayı kaçtır?

3. Bir sınıfın $\frac{3}{5}$'i kızdır. Sınıftaki erkeklerin sayısı 24 ise sınıfta kaç öğrenci vardır?

4. Bir top kumaşın önce $\frac{2}{9}$'u ,sonra kalanın $\frac{3}{4}$'ü satılıyor. Geriye 14 metre kumaş kaldığına göre kumaşın tamamı kaç metredir?

5. Bir babanın yaşı, oğlunun yaşının 3 katıdır.10 yıl önce, babanın yaşı oğlunun yaşının 7 katı idi.Babanın yaşı nedir?

1 $y+(3y-30)=170$

11 $(24+x)\cdot\frac{3}{5}$

3 $\frac{2x}{9}+\left(\frac{7x}{9}\cdot\frac{3}{4}\right)+14=x$

4 $3y+(y-30)=170$

13 $2x-25=35$

5 $7(x-10)=(3x-10)$

2 $\frac{2x}{5}=24$

1 $x+(3x-25)=35$

8 $\frac{3x}{5}=24$

7 $7(3x-10)=x-10$

9 $\frac{2x}{9}+\left(\frac{3x}{4}\right)=x-14$

1	2	3	4	5

Denklemlerin çözümü olarak düşündüğünüz sayıların numaralarını yazın ve sayılar arasındaki bağıntıyı bulun.

WORKSHEET-1 EQUALIZE THE EQUATION

Mert's father introduces their new neighbours living at the apartment that they just moved in to him. His father is helping him by providing some clues. Mert is trying to know their neighbours through creating the table give below. Let's help him. What is asked from you is to create equations. Why don't we let Mert to find the solutions of the equations?

The number of people living in Mrs. Esma's house, the number of children that Mr. Ahmet has and the apartment number of Mr. Cengiz were stated in the table. In addition to that, the equation about the number of people living in Mr.Ahmet's family was given you as an example. According to this, write the equations about the number of people and children in your neighbour's family together with their apartment number. Here we go good luck.

Neighbours	Number of people	Number of children	Apartment number
Esma	a		
Büşra			
Cengiz			c
Ahmet	$\frac{a+3}{2}$	b	

- Mrs. Esma is living in a family with 5 people. While the number of people living in Mr.Ahmet's family is the half of the number obtained after you add 3 to this number, the number of people living in Mrs. Büşra's family is 4 less than the 2 times of this number. The number of people living in Mr.Cengiz's family is one person less than Mrs. Esma's.
- The number of children that Mr. Ahmet has is the smallest positive prime number. The number children that Mrs. Esma has, is the half of the number obtained after you add 4 to this number. Mrs. Büşra has 2 times more children than Mr. Ahmet. Mr. Cengiz has 6 less than the 2 times of the number of children that Mrs. Büşra has.
- Mr. Cengiz's apartment number is 4. Mrs. Esma's apartment number is 1 less than the half of this number. And Mr. Ahmet's apartment number is 1 less than 2 times of the Mr. Cengiz's apartment number. Mrs. Büşra lives at the apartment which is 2 less than 2 times of the Mr. Ahmet's apartment number.

WORKSHEET-2 THE NUMBER in BASKET

6 friends who build a basketball team pick one among 6 envelopes for their shirt numbers. In these envelopes, there are equations that are needed to be solved. The solution sets of the equations show the shirt numbers. According to this, find the shirt numbers of these 6 people.

4^{th} Envelope:
5^{th} Envelope:
6^{th} Envelope:

Mehmet	Naz	Ahmet	Kubilay	Mete	Efe

1^{st} Envelope	**2^{nd} Envelope**	**3^{rd} Envelope**	**4^{th} Envelope**	**5^{th} Envelope**	**6^{th} Envelope**
Mehmet	Naz	Ahmet	Kubilay	Mete	Efe

1^{st} Envelope:
2^{nd} Envelope:
3^{rd} Envelope

WORKSHEET -3

I am a Poet. I am fantastic
THE CLOTHES OF THE EQUATION

I have chequered pants
My shirt has longitudinal stripes
The price of my pants and shirt is known
If you buy both of them, you will pay one hundred fifty.
Come on folks
If you buy both of them, I will not be in your way
The price of the jacket is 20 liras more than the pullover
Buy two for one hundred and your money will become more
The quality and cheap prices are here
One free for people who will buy two coats
I will give you three coats for ninety liras
If you don't like this offer, I will say goodbye to you

Find the equations in the above poem and write them. If there is any, find the solutions.

Equations and their Solutions

How many equations will there be in your poem? Let's write and find.

WORKSHEET 4 - FIND THE EQUATIONS

I need at least an hour to solve a problem. I think at the first 45 minutes. I wait 14 minutes. At the last minute, I suddenly and completely present the problem. Einstein

ACROSS

1. 6 more of the half of the Elif's walnuts is the two times of the total walnuts. How many walnuts has Elif got?
2. The sum of the two numbers of which one is equal to two times of other number is 6. What is the small number?
3. If the price of a pullover is cheaper than 2 Liras, it will be on the same price with the shirt. If the total price of shirt and pullover is 18 TL, what will be the price of the shirt?
4. If there were one more goal in a draw match, the number of goals scored in the match would be three. According to this, how many goals did the teams scored?

DOWN

1. The age of a mother who is 21 years older than her child is four times more than her child. How old is the child?
2. What is the number of which 3 more and 2/3 is 8?
3. What is the number of which 3 times of 2 less is equal to two times of the same number?

Write the names of the fruits which are corresponding to the unknown at the suitable place according to the rule.

WORKSHEET 5 - WHAT DO YOU SAY?

1. When a shop keeper counts the goods in his/her shop, the number of skirts is 25 less than 3 times of the pants. The total number of pants and skirts at the shop is 35. How many pants are there at the shop?

2. The sum of two numbers is 170. The big number is 30 less than the 3 times of the small number. What is the small number?
3. 3/5 of a class is girls. If the number of boys in that class is 24, how many students are there in the classroom?
4. First 2/9 and then the remaining ¾ of a roll of fabric was sold. We have now 14 meters long fabric. How many meters is total length of the fabric?
5. The age of a father is 3 times of his son's age. 10 years ago, the age of the father is 7 times more than his son. How old is the father.

Write the numerals of the numbers that you think as the solution of the equations and find the correlation between numbers.

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