

Overview of Lesson Study in Japan

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What Is Lesson Study?

Lesson study is a process Japanese teachers engage in to continually improve the quality of the experiences they provide for their students.

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Lesson.Study

Lesson Study is Conducted in Many Forms and Venues

In-school

- Whole group

- Content-area study groups

Across schools

- Regionally organized

- Part of mandated beginning teacher education

- Voluntarily organized clubs and circles

- Organized by educational associations and institutions

How Widely Spread Is Lesson Study?

The vast majority of elementary schools (1st to 6th grade) and many middle schools (7th to 9th grade) in Japan conduct lesson study. However, very few high schools conduct lesson study.

The Steps in Lesson Study

Lesson study involves teachers coming together to work on three main activities:

- # Identifying a lesson study goal to focus on
 - # Conducting a small number of “study lessons” that explore this goal
 - # Reflecting about the process (including producing written reports)
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Establishing a Lesson Study Goal



Setting the Lesson Study Goal (1)

- **Process for setting the goal:**

Teachers think about their students and identify important gaps between the aspirations they have for them and the results that they are actually achieving with these students.

Setting the Lesson Study Goal (2)

- **Example of a goal statement:**
 - “Promoting students' ability to think autonomously, invent, and learn from each other while focusing on problem solving in Mathematics”

Setting the Lesson Study Goal (3)

- **Summary written by the teachers about how they identified the above goal:**

The students at this school are cheerful, obedient, and very enthusiastic about learning. However, it seems as if they have not acquired the skills to think deeply about one problem, listen and pay attention to the comments of other students, and respect the opinions of other students.

Setting the Lesson Study Goal (4)

Moreover, as the students reach the upper grade levels (fifth and sixth grade), they become more and more afraid of making mistakes in front of other students. As a result of this fear, they become less willing to be active participants in the learning process.

Setting the Lesson Study Goal (5)

In order to address these problems, our school decided on the following topic “Promoting students’ ability to think on their own, invent, and learn from each other.” We felt that by choosing this topic we could build on each student’s strong desire to learn (when they face a new subject) and teach them how to enhance their learning from other students' ideas and from their mistakes (and the mistakes of others), while at same time fostering a feeling of success among all the students.

Examples of Lesson Study Goals

- # Making a circle of friends in order to grow together: focusing on a Japanese language class in order to foster students' expressive abilities
- # Developing well-thought-out mathematics lessons that provide students a feeling of satisfaction and enjoyment of mathematical activities while fostering their ability to have good foresight and logical thinking.

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Examples of Lesson Study Goals

- # Using a Japanese language class to foster students' ability to wrestle with topics they discover on their own
 - # Fostering students' lively and autonomous behavior by developing their physical strength and health
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Example of a 3-Year Lesson Study Goal

“Promoting student’s ability to think autonomously, invent, and learn from each other while focusing on problem solving in mathematics.”

Sub-goals:

- 1st year: Fostering students’ presentation skills
 - 2nd year: Fostering students’ discussion skills
 - 3rd year: Other
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Working on a “Study Lesson” (1)

Research and preparation: The teachers jointly draw up a detailed plan for the study lesson.

Implementation: A teacher teaches the “study lesson” in a real classroom, while other group members look on.

Reflection and improvement: The group comes together to discuss the instruction witnessed and what it taught them about the goal they set out to explore.

Working on a “Study Lesson” (2)

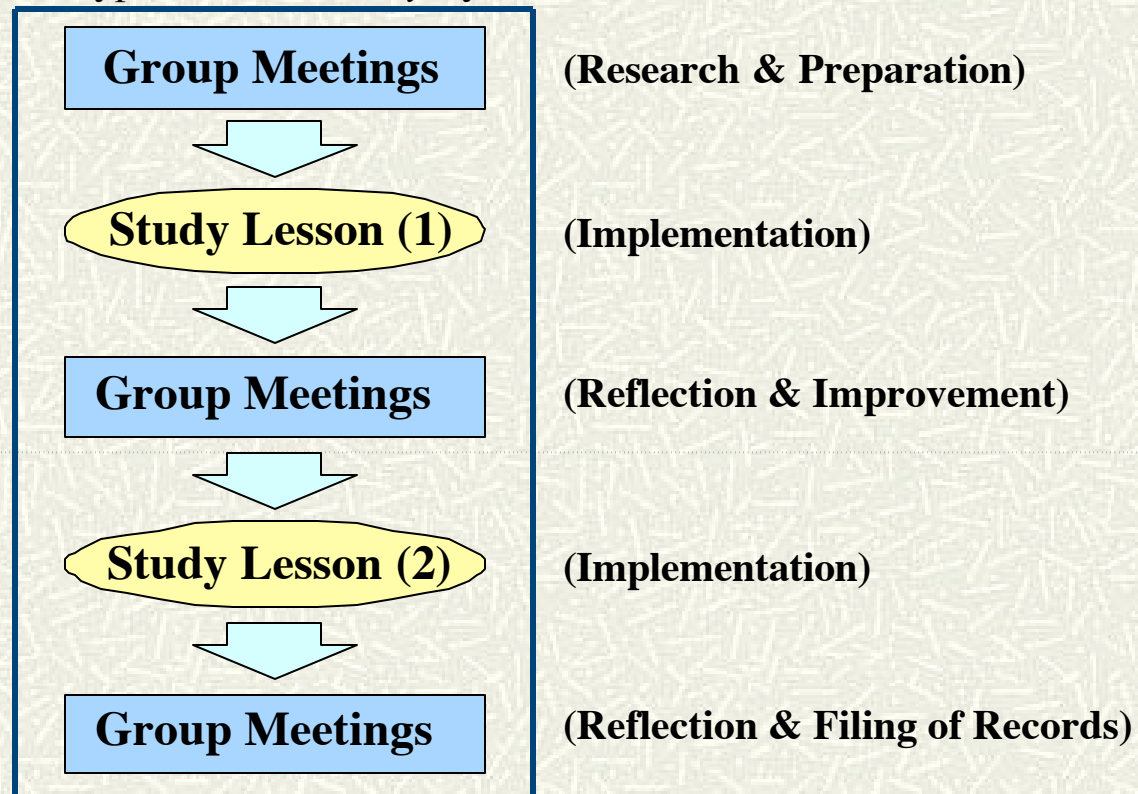
Second implementation and reflection

(optional): a second teacher teaches the “study lesson” in a real classroom, while other group members look on. This is followed by the group coming together again to discuss the instruction witnessed and what it taught them about the goal they set out to explore.

Filing records: The teachers produce a report of their work

A Lesson Study Cycle

A Typical *Lesson Study* Cycle



Lesson Plan

算数科学習指導案

指導者 佃 恵 子

- 1 日 時 1993年11月18日(木) 第2校時
 2 学 年 第1学年梅組 男子11名 女子8名 計19名
 3 単元名 ひきざん(2)
 4 単元設定の理由

これまでに児童は、繰り下がりのない求残、求差などの場面を通して、引き算の意味を学習してきた。また、数の合成、分解をすることによって数はいろいろな形でとらえることができることも着目してきた。そして、繰り上がりのあるたし算の計算などで、数の多面的な見方を利用していろいろな計算の仕方を考えたりしてきた。

ここでは、これらの学習を基に、(10いくつ) - (いくつ)の計算で、一のくらの端数だけでは、引き算ができない場合は、十のくらの1をくずして10にすれば、今までと同じように引き算ができることに気付かせていく。そして、十進位取り記数法で表される数の仕組みの理解を深めていけるようにする。さらに数値に応じて、手際のよい方法を選んで、繰り下がりのあるひき算の計算ができるようにする。

本学級の児童は、繰り下がりのないひき算については、M以外の児童は、その意味や操作方法を理解し、答えを正確に求めることができるようになった。しかし、それにかかる時間は大きく異なり、ブロックなどの操作よりすぐ手の指を使う児童も多い。また、繰り下がりのあるたし算や、繰り下がりのあるひき算の素地と考えられる数の合成・分解、10の補数、3口の計算なども、暗算で答えを出す児童から、具体物を使っても答えを出すまでに長時間かかる児童まで計算の処理能力の差が激しい。そのような中でも算数を「すき」と応えている児童は比較的多く、その理由として「ブロックや、タイルなどを動かしながらする(操作活動)のが楽しい。」「クイズのようで楽しい。」「いろいろな発表ができて楽しい。」などをあげている。

そこで、指導にあたっては、どの児童も意欲的に取り組めるよう、子供達の生活の中から問題を取り上げ、操作活動に子供達の考えの残る教具の工夫をするともに、その問題の解決が、本単元のねらいの達成になるよう仕組んでいきたい。問題の数値についても本時には、『12-7』を設定することで、答えの求め方が減加法だけでなく減々法・数えびき、補加法など、いろいろな考え方が出せるのではないかと考えた。

また、次時からの学習で、手際のよい計算方法を考えさせながら、減加法、減々法の習熟を図りたい。そのために、10の補数を反射的に見付けさせたり、減数を被減数の一のくらの数と残りに分解することも繰り返し練習させていく。

- 5 単元目標
 ①減法が、用いられる場面の理解を深める。
 ②減法の記号と等号を用いて式を書いたり、読んだりすることの理解を深める。
 ③1位数と1位数の繰り上がりのある加法の逆の減法の計算の仕方を理解する。
 ④1位数と1位数の繰り上がりのある加法の逆の減法の計算が確実にできるようにする。
 ⑤1つの数を、他の数の差としてみるができるようにする。

6 関連事項

1年	2年	3年	4年	5年
加算と減算の意義 ①被減数1位数 ②被減数2,3位の計算 ③被減数3,4位の計算 ④被減数4,5位の計算 ⑤被減数6,7,8,9位の計算	加算の意義と式 ①被減数1,2位の計算 ②被減数2,3位の計算 ③被減数3,4位の計算 ④被減数4,5位の計算 ⑤被減数6,7,8,9位の計算	加算と減算の意義 ①被減数1,2位の計算 ②被減数2,3,4位の計算 ③被減数4,5,6,7,8,9位の計算 ④被減数10,11,12位の計算 ⑤被減数13,14,15,16,17,18,19位の計算	加算と減算の意義 ①被減数1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20位の計算 ②被減数21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40位の計算 ③被減数41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60位の計算 ④被減数61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80位の計算 ⑤被減数81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100位の計算	加算と減算の意義 ①被減数1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000,1001,1002,1003,1004,1005,1006,1007,1008,1009,1010,1011,1012,1013,1014,1015,1016,1017,1018,1019,1020,1021,1022,1023,1024,1025,1026,1027,1028,1029,1030,1031,1032,1033,1034,1035,1036,1037,1038,1039,1040,1041,1042,1043,1044,1045,1046,1047,1048,1049,1050,1051,1052,1053,1054,1055,1056,1057,1058,1059,1060,1061,1062,1063,1064,1065,1066,1067,1068,1069,1070,1071,1072,1073,1074,1075,1076,1077,1078,1079,1080,1081,1082,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1109,1110,1111,1112,1113,1114,1115,1116,1117,1118,1119,1120,1121,1122,1123,1124,1125,1126,1127,1128,1129,1130,1131,1132,1133,1134,1135,1136,1137,1138,1139,1140,1141,1142,1143,1144,1145,1146,1147,1148,1149,1150,1151,1152,1153,1154,1155,1156,1157,1158,1159,1160,1161,1162,1163,1164,1165,1166,1167,1168,1169,1170,1171,1172,1173,1174,1175,1176,1177,1178,1179,1180,1181,1182,1183,1184,1185,1186,1187,1188,1189,1190,1191,1192,1193,1194,1195,1196,1197,1198,1199,1200,1201,1202,1203,1204,1205,1206,1207,1208,1209,1210,1211,1212,1213,1214,1215,1216,1217,1218,1219,1220,122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1,2222,2223,2224,2225,2226,2227,2228,2229,2230,2231,2232,2233,2234,2235,2236,2237,2238,2239,2240,2241,2242,2243,2244,2245,2246,2247,2248,2249,2250,2251,2252,2253,2254,2255,2256,2257,2258,2259,2260,2261,2262,2263,2264,2265,2266,2267,2268,2269,2270,2271,2272,2273,2274,2275,2276,2277,2278,2279,2280,2281,2282,2283,2284,2285,2286,2287,2288,2289,2290,2291,2292,2293,2294,2295,2296,2297,2298,2299,2300,2301,2302,2303,2304,2305,2306,23

10. 授業過程

学 習 活 動 と 発 問	予想される児童の反応	教 師 の 対 応 ・ 留 意 点	評 価
<p>1. 問題場面の把握</p> <p>「この前、落ち葉拾いに行ったね。どんな葉っぱを拾ったかな。」</p> <p>「そうですね。神社の所の大きな銀杏の葉っぱを12枚ずつ拾って家族の顔も描いたよね。」</p> <p>「Aさんは、何枚描きましたか。」</p> <p>「Bくんは、何枚描きましたか。」</p> <p>「西先生は、何枚描きましたか。」</p> <p>「西先生は、10枚拾って、5枚描いたんじゃないか。何枚余ったでしょう。」</p> <p>「みんなも、余りましたか。」</p> <p>2. 問題の提示</p> <p>①問題の提示し、既習のひき算の計算方法を復習する。</p> <p>「みんなすごいね。生活科の勉強じゃったのに、算数もしよったんじゃないか。何算をしたのですか。」</p> <p>「みんなが、頭の中でした問題はこんな問題かな。」</p> <p>□は、いちょうのはっぱを□まいひろいました。それに、かぞくのえを□まいかきました。このりは、なんまいでしょうか</p> <p>「どうですか。」</p> <p>□には、何をいれればよいでしょうか。」</p> <p>「西先生の場合じゃったら、どういうふうに入れる？」</p> <p>「この問題の式は？」</p> <p>「答えは？」</p> <p>「今度は個先生にしよう。個先生は、みんなと同じように12枚拾いましたね。先生の家族は2人で、2枚描きました。」</p> <p>「個先生の問題を作ってください。」</p> <p>「いいですか。これはどんな式で答えが分かりますか。」</p> <p>「答えは、いくつですか。」</p> <p>「どうやって、答えを見付けましたか。」</p> <p>②本時の中心的課題をつかむ。</p> <p>「今度は、C君の場合で考えてみましょう。C君は、家族の絵を何枚描きましたか。」</p> <p>「これを問題にしましょう。」</p>	<p>・赤や茶色い葉っぱ。</p> <p>・すすきや柿もあったよね。</p> <p>・栗もひらったよ。</p> <p>・おもしろい顔になった。</p> <p>・僕、余ったんよ。」</p> <p>A・4枚。あつこの前赤ちゃん生まれたから5枚です</p> <p>B・4人じゃええ4枚。</p> <p>西・5枚です。</p> <p>・5枚。</p> <p>・ええと（指を使って）5枚です。</p> <p>・余った。</p> <p>・いっぱい余った。</p> <p>・8枚余った。</p> <p>・すごいじゃろう。</p> <p>・ええと、何算じゃったかいね。</p> <p>・ひき算です。</p> <p>・□がわかりません。</p> <p>・よう、分かん。</p> <p>・拾った人の名前じゃあ。</p> <p>・拾った数と絵を書いた数です。</p> <p>・「西先生は、いちょうのはっぱを10枚拾いましたそれに、家族の絵を5枚描きました。残りは、何枚でしょうか。」です。</p> <p>・10-5です。</p> <p>・5です。</p> <p>・ちがいます。5枚です。</p> <p>・「個先生は、銀杏の葉っぱを12枚拾いました。それに、家族の絵を2枚描きました。残りは、何枚でしょうか。」です。</p> <p>・12-2です。</p> <p>・10です。</p> <p>・12の2から2をひきました。</p> <p>C・7枚描きました。</p> <p>・「C君は、銀杏の葉っぱ</p>	<p>・発表や挙手が上手にできていた児童については、いろいろな場面で肯定的な評価をする。</p> <p>・場所を変えて、限定12枚拾わせた銀杏の葉のことを思い出させる。</p> <p>・あらかじめ、児童の家族の数を調査しておく。</p> <p>・西先生は、10枚拾ったことをおさえる。</p> <p>・問題の設定場面を理解し、引き算で答えが求められることに気付かせる。</p> <p>・10の補数を思い出させる。</p> <p>・算数の時間だけでなくいろいろな場面で算数の学習を利用していることに気付かせたい。</p> <p>・児童との話し合いを基に、引き算で求められる問題を提示し、復習させながら、問題を把握させる</p> <p>・問題提示のときに必要な条件は何であったか確認する。</p> <p>・問題の数値を少しずつ変化させて、残りを求める場面ではひき算を使うことを確認していく。</p> <p>・繰り下がりのない2桁の計算を思い出させ、この場合は、一のくらしいどうしひき算をすれば答えが求められたことを確認する。</p>	<p>ア～前向きに思っているか。</p> <p>イ～引き算で答えが求められることが分かったか。</p> <p>ウ～10-5を簡単に求めることができたか。</p> <p>イ～□の中に何が入れば問題として成立することができると分かったか。</p> <p>イ～問題に、適切な数を入れて考えることができたか。</p> <p>イ～問題に、適切な数を入れて考えることができたか。</p> <p>ウ～12-2の計算ができたか。</p> <p>イ～問題に、適</p>

<p>「いいですか。[わかっていること]と[きいていること]を見付けて下さい。」</p>	<p>を12枚拾いました。それに、家族の絵を7枚描きました。残りは、何枚でしょうか。」です。</p>		<p>切な数を入れて考えることができたか。</p>
<p>3. 問題の解決</p> <p>①立式考える。 「[わかっていること]と[きいていること]から、式を考えてください。」</p> <p>②課題をつかむ。 「そうですね。でも、12と7を比べるとどちらが大きい?」「では、ひけそうですね。」「今日は、12-7の答えの見付け方を考えていきましょう。」</p> <p>③自力解決 「もう、葉っぱは、貼ってしまったので、今日はこのタイルで考えてみようね。どうやって、答えを見付けたか、見付け方を、みんなに後で教えてあげるのでどう考えたか、言葉でも書いておいて下さい。」</p>	<p>・分かっている数は、12と7です。 ・分かっている数は、拾った数が12枚で、描いた数が7枚です。 ・きいていることは、「残りは何枚でしょう」です ・7-12 ・12-7 ・2から7はひけんよ。</p> <p>・12 ・難しそう。 ・かんたんだよ。</p> <p>(a) 引けそうだけど、どうしたらいいだろう。 (b) 数えひき ・12から、1つつ取って残りを数える。 ・12を10と2に分けて、10から1つつ取って残りの数を数える。 ・12-7だから、7までは同じで8、9、10、11、12と指を折り数える。(補加法) (c) 減加法 ・12を10と2に分け、10から、7を引く。その答え3と分けた2で答えは、5。 (d) 減々法 ・7を2と5に分け12から2を引く。その答え10から5をひいて答えは、5</p>	<p>・学習プリントに式を書かせる。</p> <p>・一位数どうしがひけないことに気付かせ、その計算方法を考えさせる。</p> <p>・タイルは、白紙の画用紙に自由に貼らせ、12をどの様にとらえたか把握する。また、減数を取り除くのではなく、裏返して残すことで、どこから引いていったかも分かるようにする。 ・学習プリントには、文章で自分の考えを書かせる。 ・繰り上がりのあるたし算で Aタイプ…数の合成分解が簡単にできる。暗算で計算する。 Bタイプ…半具体物などの操作により答えを求める。 Cタイプ…具体物や指を用いないと計算ができにくい。 を把握しておき、特にCタイプの児童には、机間相談をし、必要であれば、銀杏の葉を渡す。</p>	<p>エ〜正しい立式ができたか。</p> <p>ア〜具体的なものを使いながら進んでひき算の計算をしようとしているか。</p> <p>エ〜12-7の計算の意味や方法が分かったか。</p> <p>ウ〜12-7の計算ができたか。</p> <p>ア〜自分の考えを大きな声で発表できたか</p>
<p>4. 解決方法の発表と、繰り上げ 「どうやって答えを見付けたか、みんなに分かるように教えて下さい。」</p> <p>「まだ、他に違うやり方がありますか。」</p> <p>(どうして、12を10と2に分けたのですか。) (どうして、7を5と2に分けたのですか。)</p>	<p>・ある、ある。</p> <p>・どうして、12を10と2に分けたのですか。 ・どうして、7を5と2に分けたのですか。</p>	<p>・机間巡視のときに児童の考えをメモしておき、(b)(c)(d)の順に発表させたい。 ・同じ考えの児童の名札を掲示した画用紙の下に貼る。</p> <p>・説明不足などで分からないところがあれば質問させる。児童から質問が出ない場合教師が質問する</p>	<p>ア〜友だちの意見をよく聞くことができたか。</p> <p>イ〜繰り下がりのあるひき算の答えの見付け方にはいろいろな方法があることが分かったか。</p>
<p>5. まとめと次時の予告 「12-5の問題をどの方法でもいからやってみよう。」</p> <p>「では、12-9はどの方法がいいかな。」 「どの方法がいいかこんどの時間にやってみようね。」</p>	<p>・同じ方法でやろう。 ・Kさんのやり方のほうが便利かな。 ・N君のやり方でやってみよう。</p> <p>・やってみると分かんね。 ・ええと、ぼくは、(b)かな。 ・(c)のやり方が速いよ。 ・やってみたいよ。</p>	<p>・D、E、F、G、A、Mの場合のひき算であることに触れる。 ・友だちの考えを聞き、違う方法で取り組んでいる児童をメモし、次時につなげる。 ・まだ、12から1つつ数え引く方法でしている児童は、10から数え引く考え方に導く。</p>	<p>ウ〜自分の納得できる方法で答えを出すことができたか。</p> <p>ア〜次時に意欲を持てたか。</p>

Learning Activities and Questions [<i>hatsumon</i>]	Expected Student Reactions	Teacher Response to Student Reactions / Things to Remember	Evaluation*
<p>1. <u>Grasping the Problem Setting</u></p> <p>"The other day we went leaf collecting, didn't we? What kind of leaves did you get?" "That's right. You collected 12 leaves from the big Ginkgo tree at the Shinto shrine and drew the faces of the people in your family on the leaves.</p> <p>"How many leaves did you use for drawing faces, Student A?" "How many leaves did you use for drawing faces, Student B?" "How many leaves did Ms. Nishi use for drawing faces?" "Ms. Nishi collected 10 leaves and drew 5 faces." "How many leaves are left over?"</p> <p>"Did everyone have leaves left over?"</p>	<ul style="list-style-type: none"> • Red and brown leaves • There were miscanthuses and persimmon trees, too. • I collected chestnuts, too. • "The pictures turned out pretty funny." • "I collected so many leaves that I have some left over." <p>A: 4 leaves. Oh, we had a new baby the other day, so 5 leaves. B: Because my family is 4 people, so 4 leaves.</p> <p>Ms. Nishi: 5 leaves.</p> <ul style="list-style-type: none"> • 5 leaves • Well, (by using fingers) it is 5 leaves. <ul style="list-style-type: none"> • (Yes) there were (leaves) left over. • I had a lot of leaves left over. • I had 8 leaves left over. 	<ul style="list-style-type: none"> • Give praise to the students who did great job reporting their answers and raising their hands at various situations during the lesson. • Remind the students that they collected only 12 Ginkgo leaves after they changed the location. • Check out beforehand how many people are in each student's family. • Make sure that all the students know that Ms. Nishi collected only 10 leaves. • Make students understand the problem setting and the teacher is looking for students to answer the questions by using subtraction. • Remind them of the supplementary numbers of 10. 	<p>a. Are the students positively trying to recall the event?</p> <p>b. Do the students understand they can solve these problems using subtraction?</p> <p>c. Were the students able to solve the problem 10-5?</p>

1. Planning a Study Lesson



2a. Implementing the Study Lesson



2b. Observing the Study Lesson



3. Reflecting on the Study Lesson



Re-Implementing the Study Lesson



Reflecting on the Study Lesson

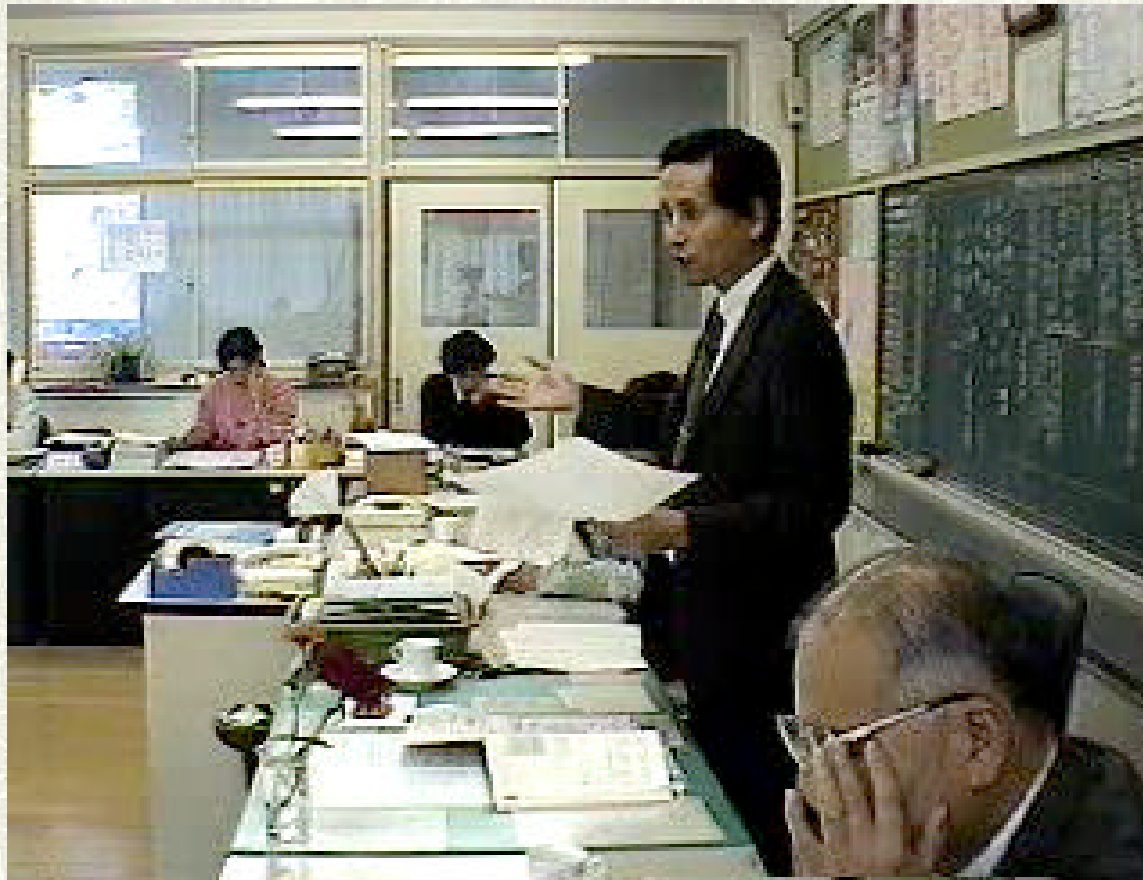








Outside Advisor

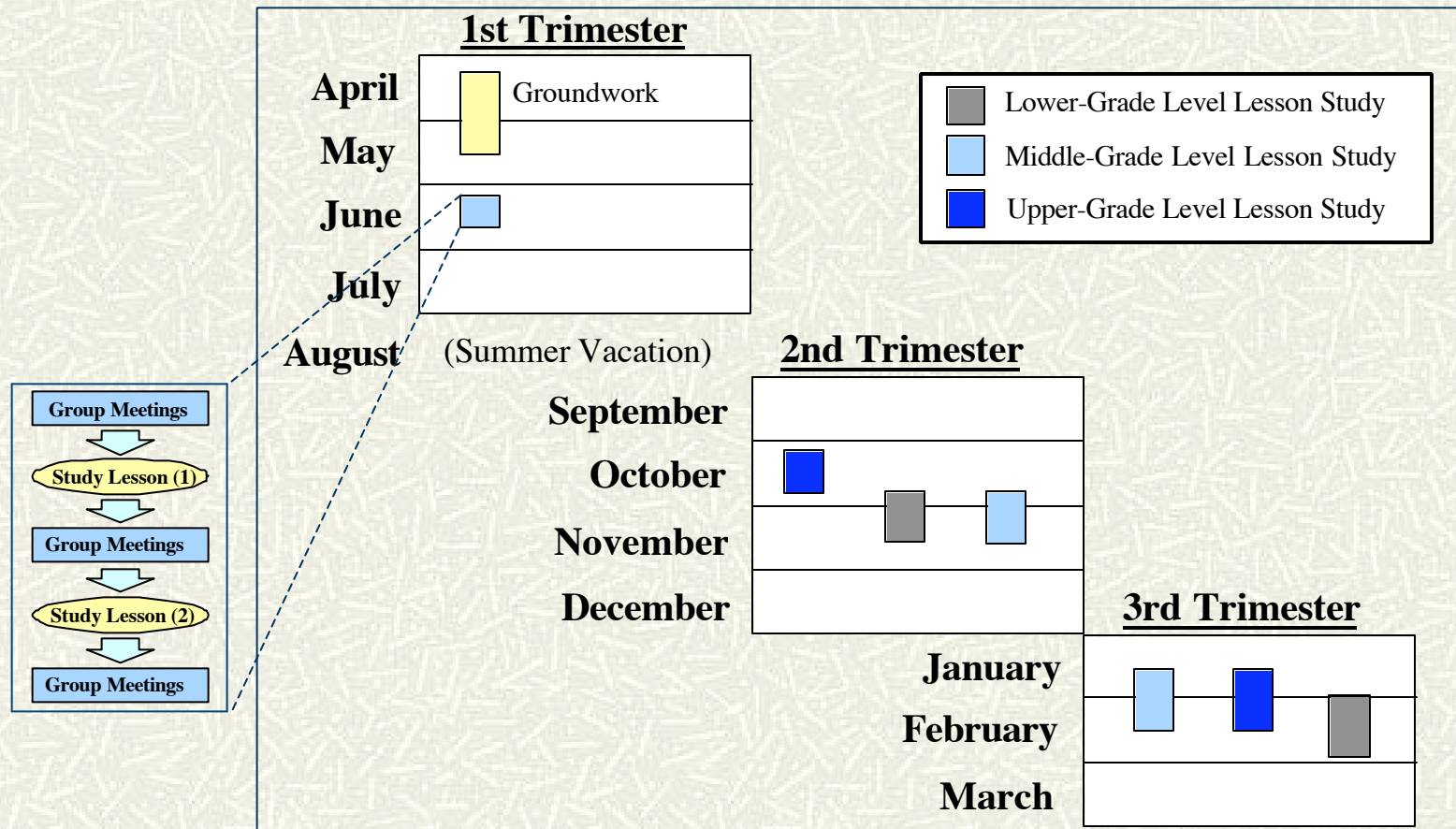




The Organization of Lesson Study

- # A school generally works on the same goal and same content area for 3 to 4 years (e.g., mathematics).
 - # Every year the lesson study goal is refined as the group's understanding of this goal evolves as a result of doing lesson study.
 - # In a school, study lessons are planned by sub-groups of 4 to 6 teachers who generally teach the same or similar grades.
 - # Each sub-group will generally carry out 2 or 3 lesson study cycles per year.
-

A Year-Long Schedule for Lesson Study

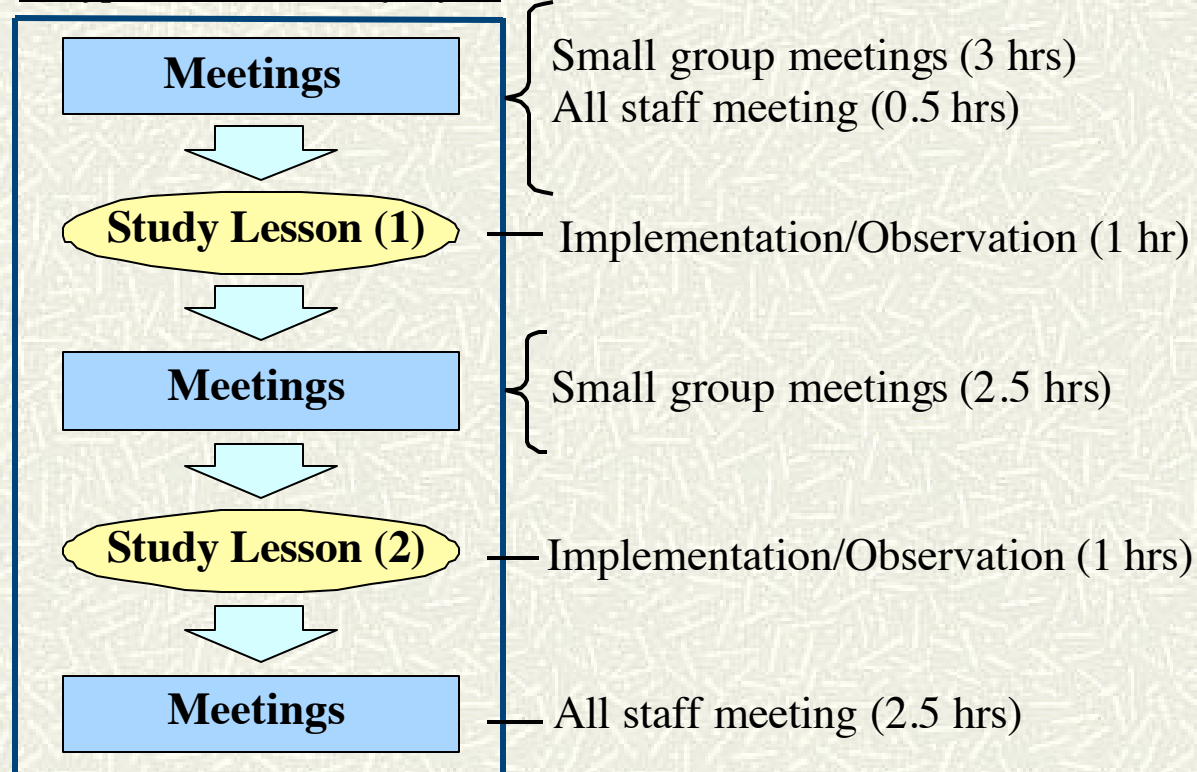


The Organization of Lesson Study (2)

- # Sub-groups working on a study lesson have a regular meeting time, generally after school.
 - # Staff meeting time is also allotted for teachers to share their work with those who are not part of their lesson study sub-group.
 - # All teachers are invited to come and view the study lessons. At a minimum, all those who planned the lesson and a number of teachers from outside the planning group are present.
-

A Concrete Example of How the Work Is Organized During a Cycle

A Typical Lesson Study Cycle

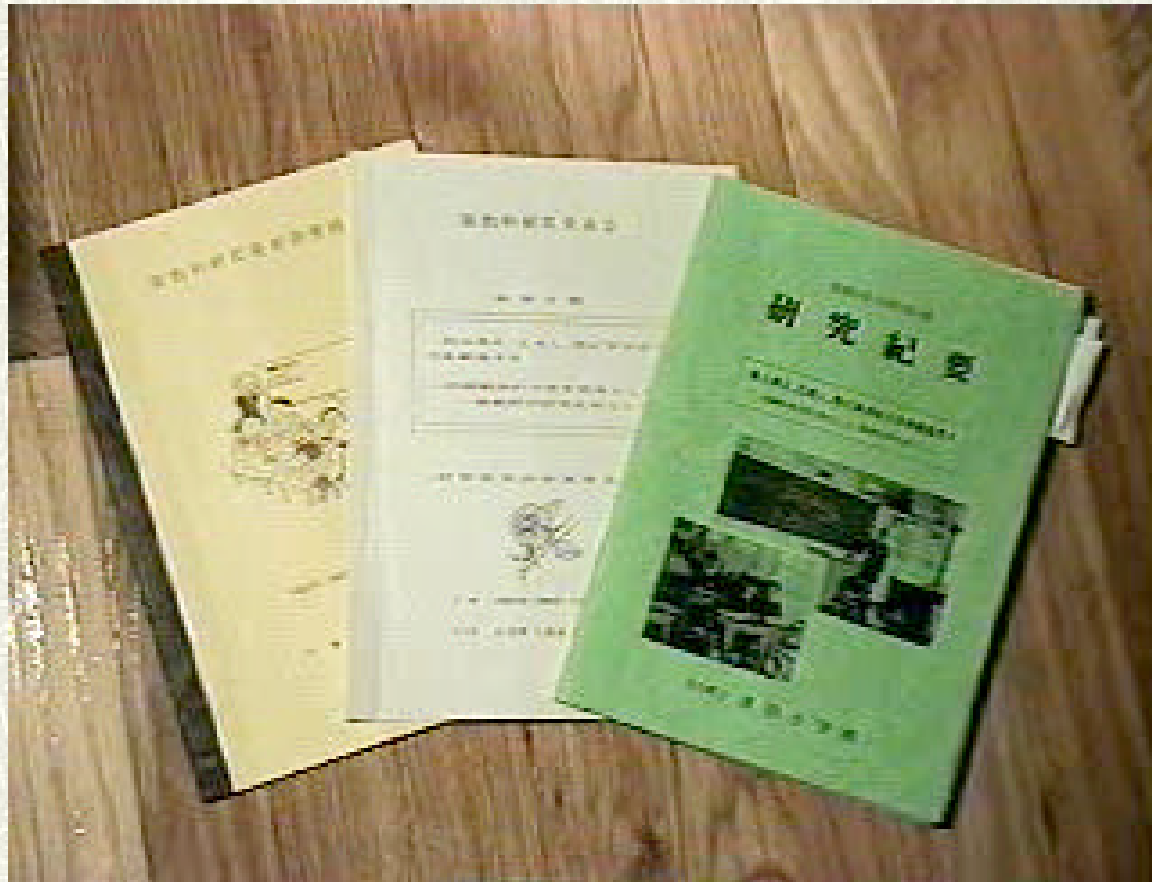


(Total = at least 10 hours in about 3 weeks)

The Lesson Study Open House

- # The purpose is for a school to share its lesson study work with other schools
 - # An open house entails teaching and discussing study lessons with invited guests
 - # Lesson plans are made available to guests, along with a brochure that describes the school and the lesson study work being conducted there (including a discussion of achievements and challenges)
 - # Researchers and other experts are often invited to these meetings to provide their perspective
-

Research Report Booklet



Publications by Teachers



Education Book Section at Large Bookstores

Open House Study Lesson



6th Grade Lesson









Post-Lesson Conference



All-Teacher Meeting



Party Time!!

What Did the Teachers Discuss? (1)

- # The organization and goal of the unit
 - # Mathematical concepts introduced in the unit
 - # The goal of the lesson
 - # The problem the lesson will focus on
 - # Manipulatives and handouts
 - # The solutions anticipated from students and teacher's responses to these
-

What Did the Teachers Discuss? (2)

- # Planning questions [*Hatsumon*] that promote student thinking
 - # Organization of blackboard and use of other media
 - # Time allocation for different parts of the lesson
 - # Handling individual differences
 - # How to end the lesson
 - # How to evaluate the lesson
-

What Did the Teachers Discuss? (3)

- # Abstract issue about mathematics education (e.g., What do we teach to the students by teaching the subject of mathematics?)
 - # Fostering students' other skills besides knowledge about mathematics (e.g., Students' listening skills and presentation skills)
 - # How the lesson is related to the lesson study goal
-



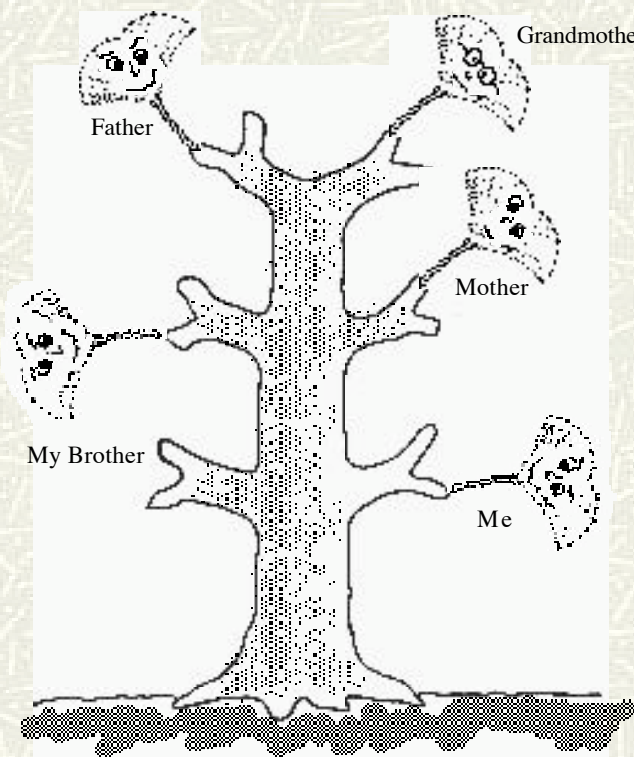
Example of Discussion of Manipulatives



My Family y

Name _____

Let's paste the Ginkgo leaves the same number as
your family members.



Ginkgo leaves

The Story Problem

Akira collected **12** Ginkgo leaves.
Then he drew **7** faces of his family
on the leaves. How many leaves are
left over?

$$12 - 7 =$$

Some Example of Students' Anticipated Solutions

■ Counting-Subtraction Method [*Kazoehiki*]:

Taking away 7 from 12 by counting

■ Subtraction-Addition Method [*Genkaho*]

12 consists of 10 and 2

$$10 - 7 = 3 \quad 3 + 2 = 5$$

■ Subtraction-Subtraction Method [*Gengenho*]

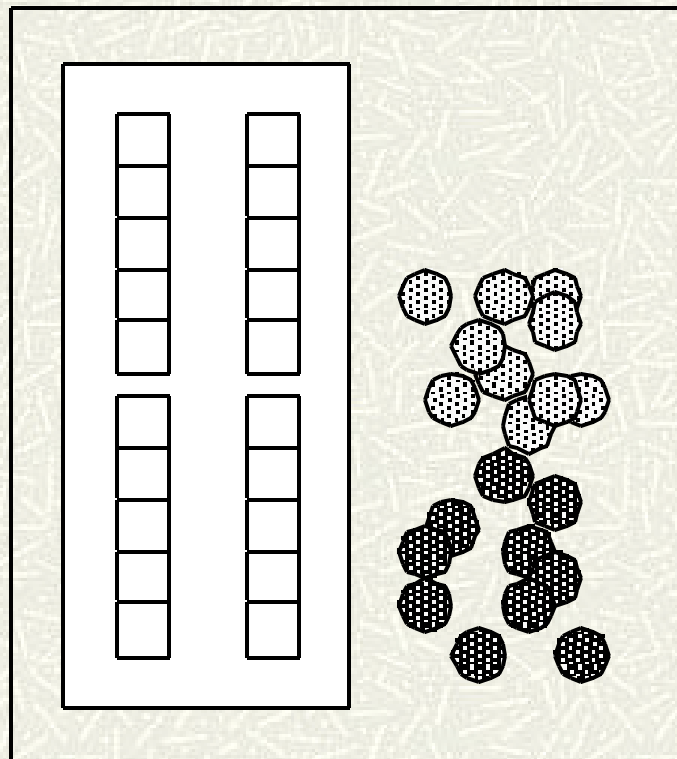
12 consists of 10 and 2

7 consists of 5 and 2

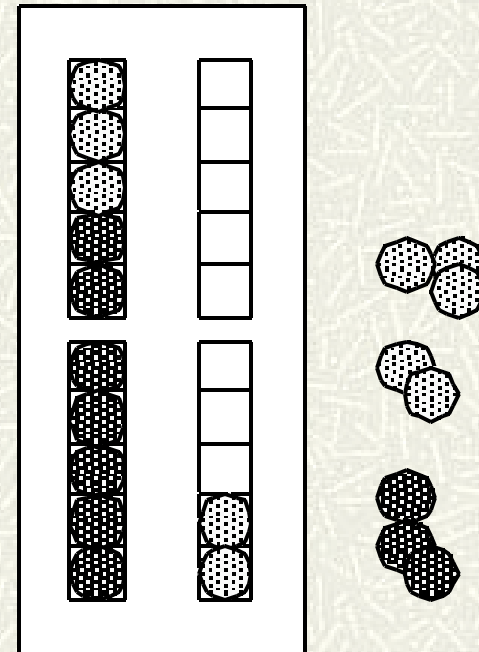
$$12 - 2 = 10 \quad 10 - 5 = 5$$

Example of Manipulatives

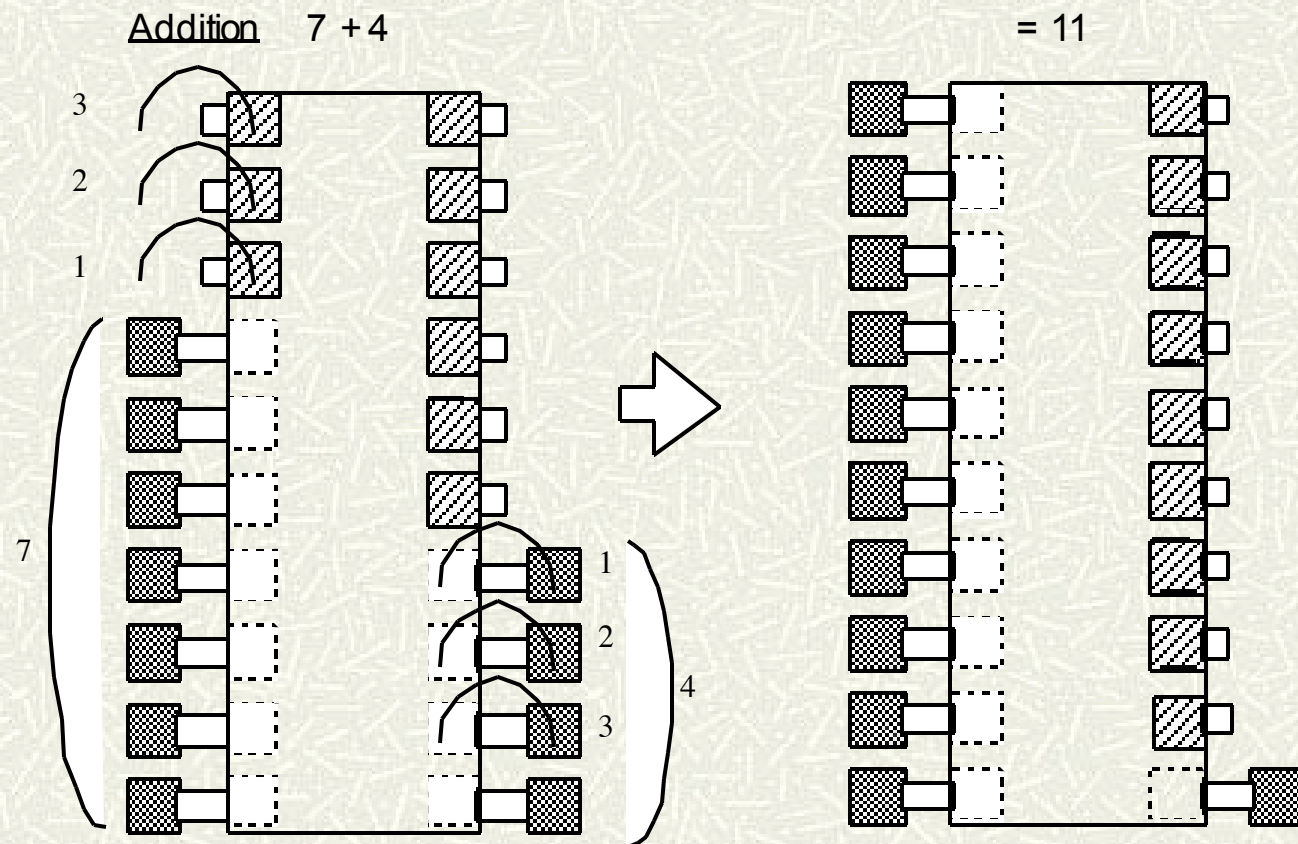
Ohajiki-ban (Tiddlywinks Board)



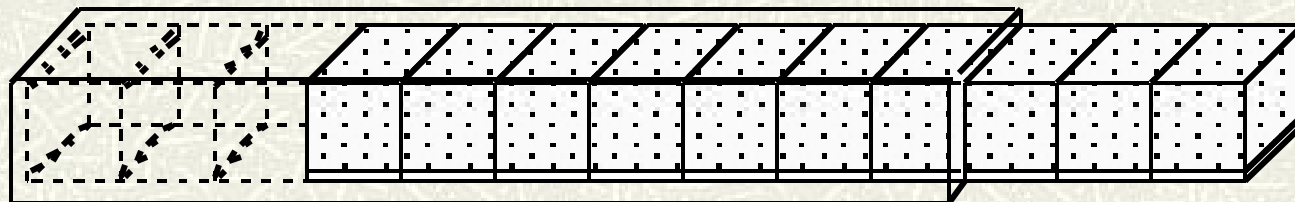
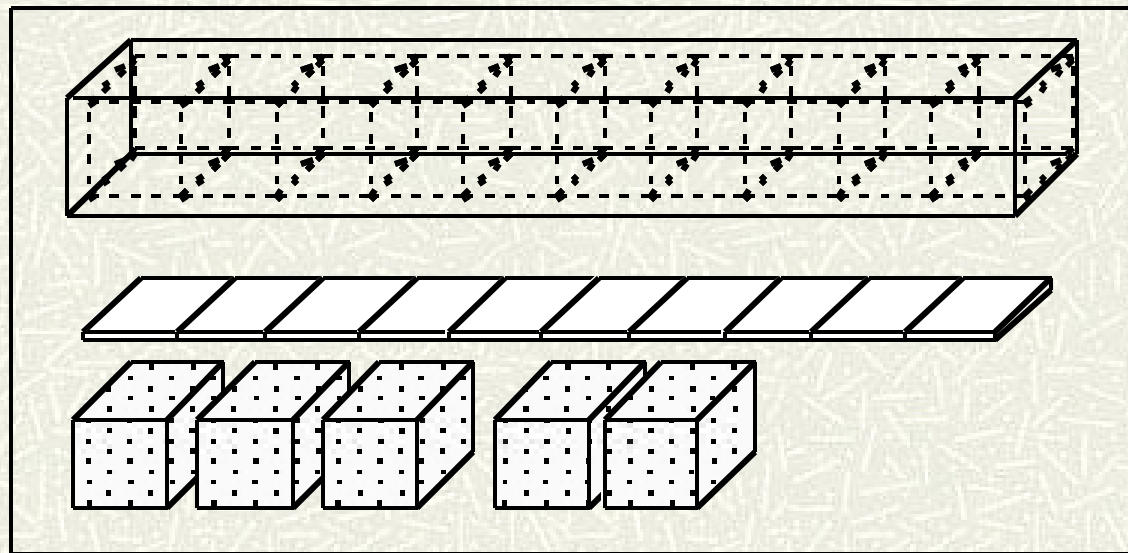
Addition $7 + 5 = 12$

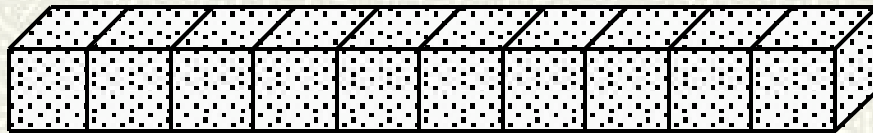


Flip Tile Board [Pata Pata Tiles]

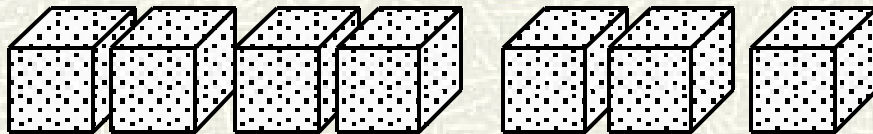


Number Blocks [*Kazu no Burokku*]





Wooden rectangular
prism that represents 10



Wooden cubes (each
cube represent 1

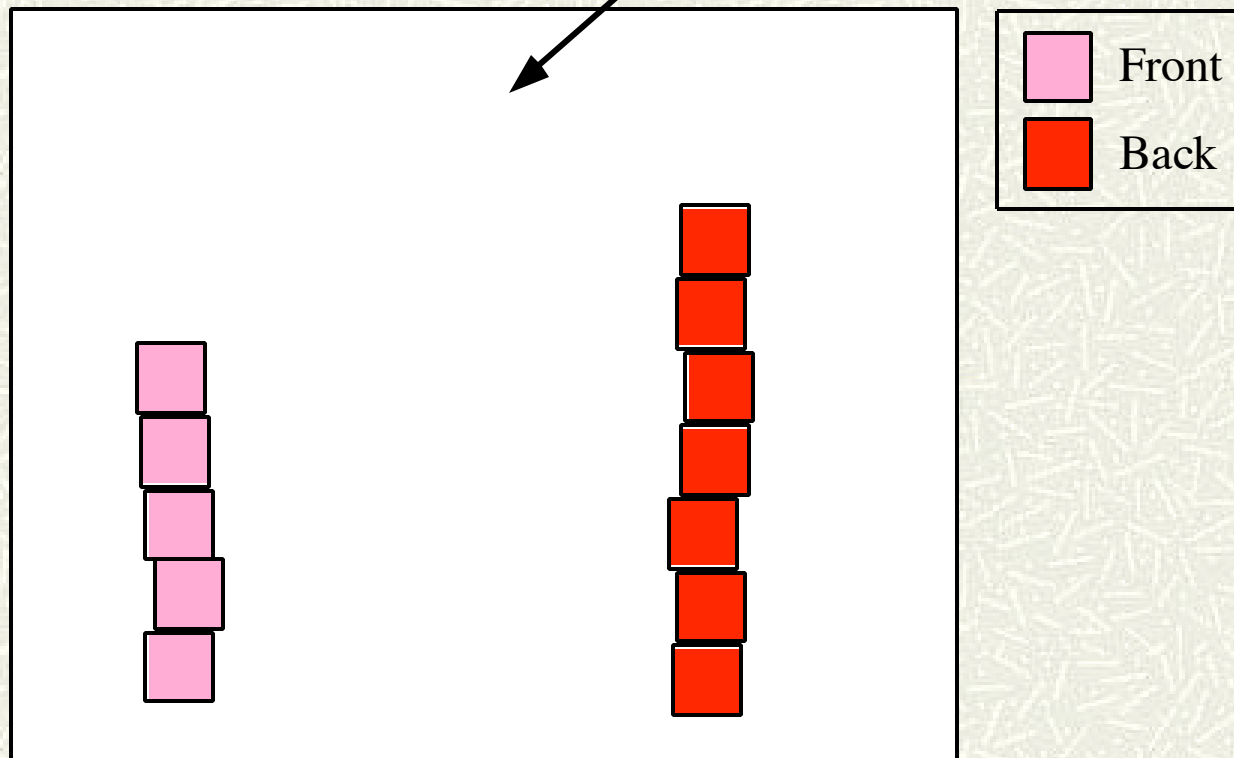
What to Look for in a Manipulative

- # Leaves a record of students' thought processes
 - # Easy for students to understand how to use them
 - # Easy for students to explain their solutions using them
 - # Easy to put them back into their original position or shape so that students can rethink their thought processes
-

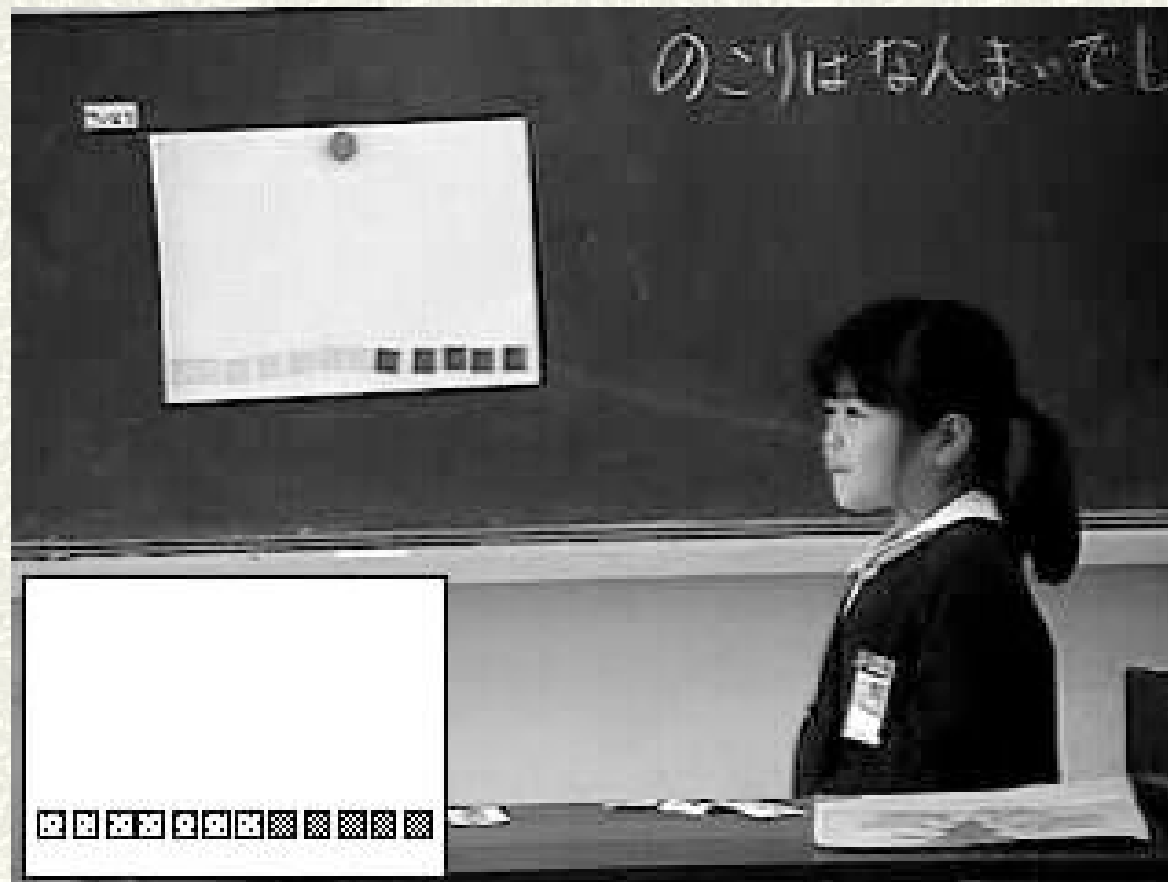
Manipulative Used for the First Study Lesson

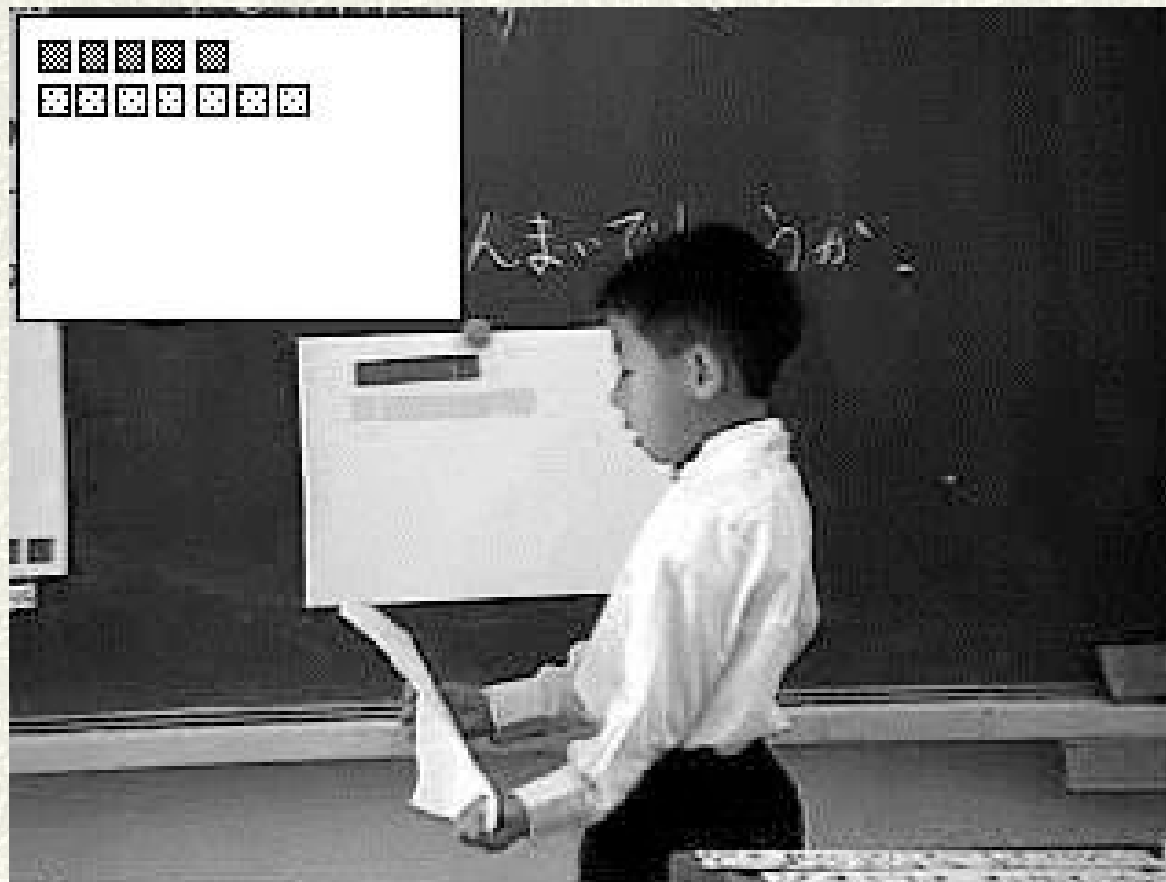
New Ohajki-ban

Drawing Paper







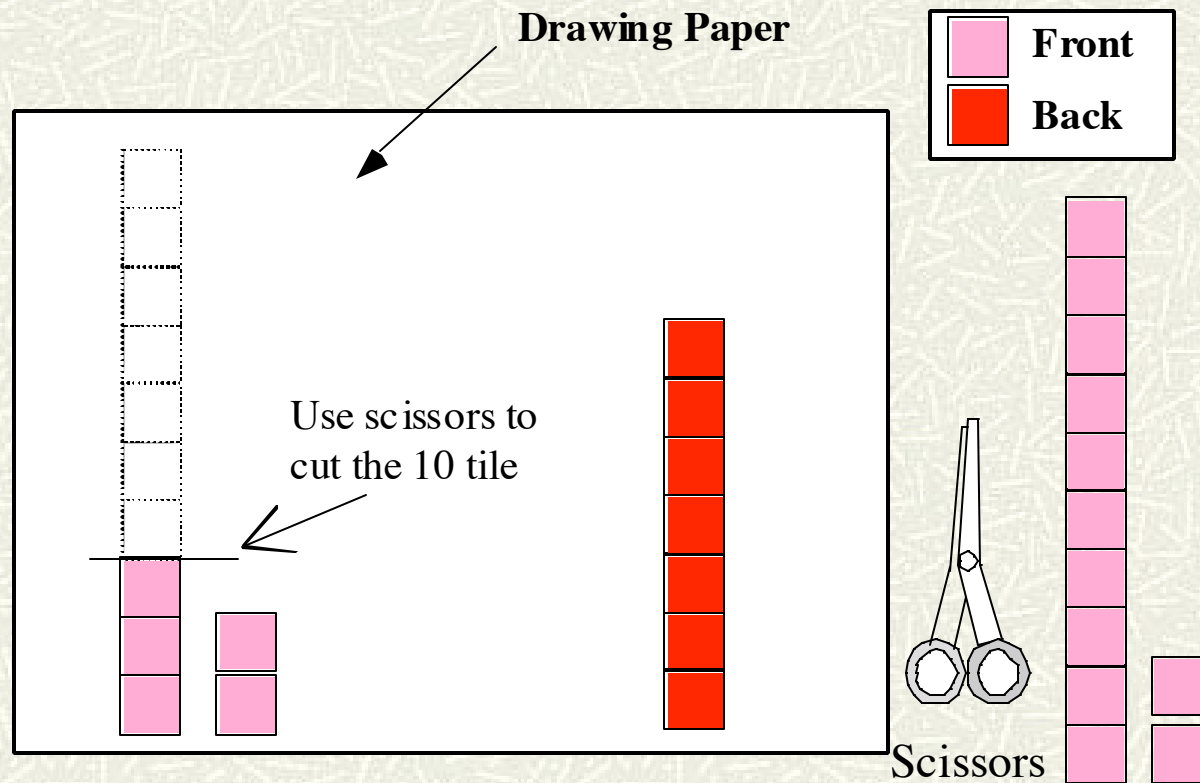


What Did the Teachers Learn?

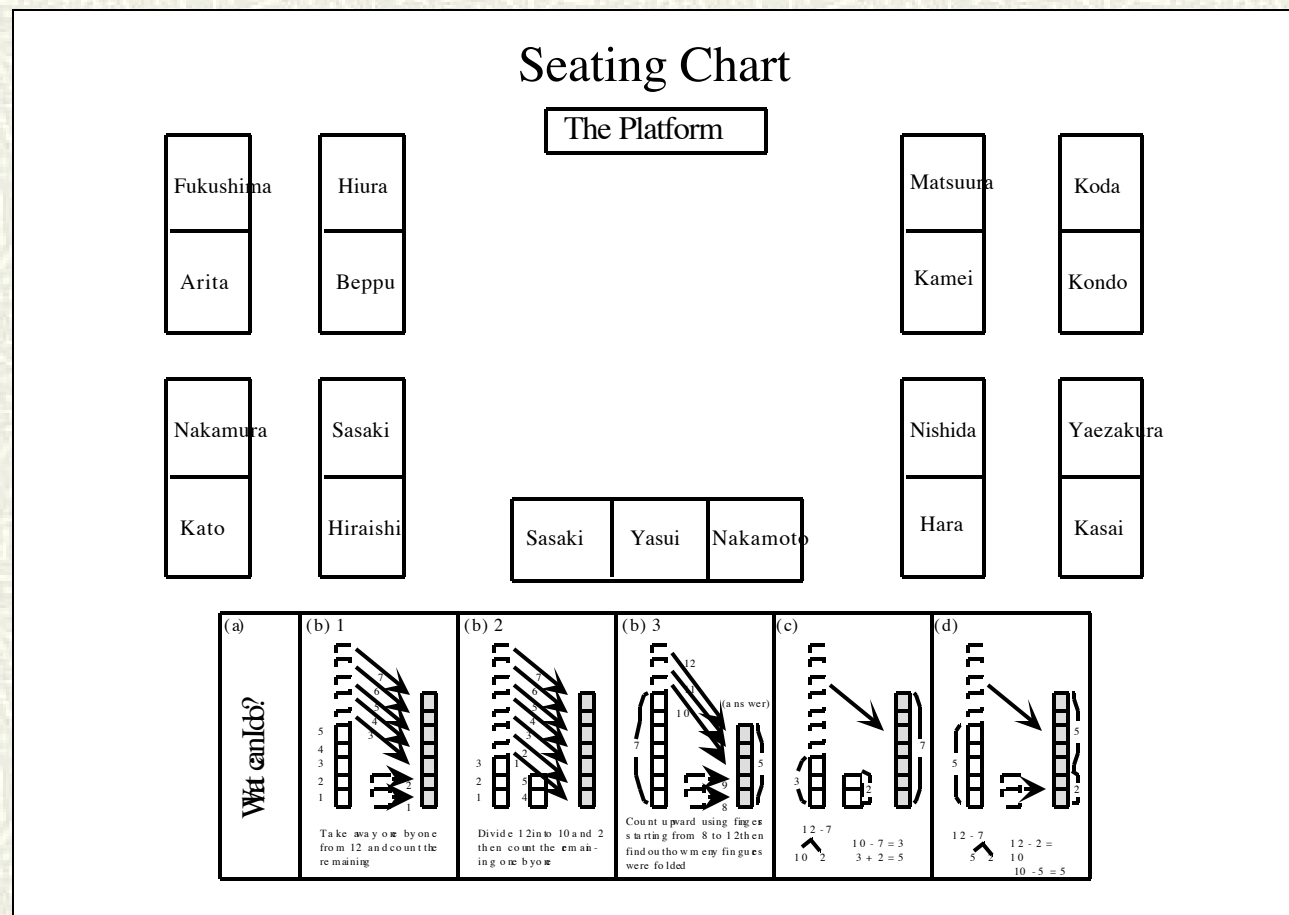
- # Use of individual tiles made it difficult for teachers to understand what kind of methods students were using.
 - # Use of individual tiles also made it difficult for the students to understand the methods other students' presented.
-

Improved Manipulative for the Revised Study Lesson

Improved Ohajki-ban



Students' Seating Chart



$10 \times 14 \frac{1}{4}$ inch paper

Handout (1)

Arithmetic Handou

collected Ginkgo
leaves. Then s/he drew
pictures of his/her family on the leaves.
How many leaves are left over?

[*Shiki* (Expression)]

[Answer]

Name

[How did you find the answer]

First,

Next,

$10 \times 14 \frac{1}{4}$ inch paper

Handout (2)

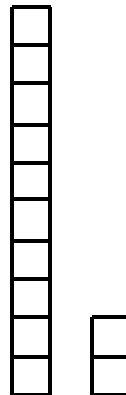
Mathmatics Hando ut

Name

[Expression]

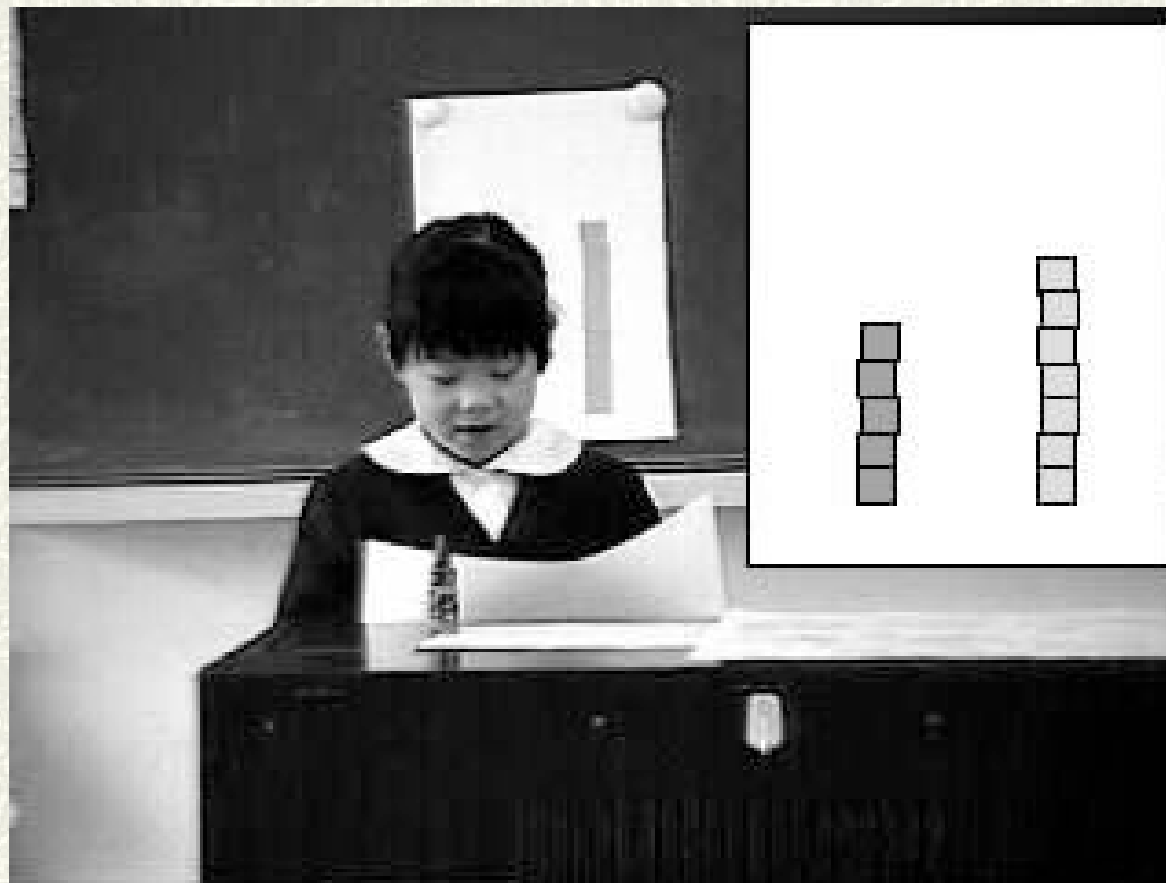
[Answer]

's method


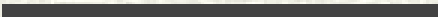


10 x 7 inch paper







- 
- # Lesson study is a collaborative activity
 - # Lesson study is a form of research
 - # Lesson study keeps students at the heart of the process.
 - # “Lesson” study is not just about the lesson.
- 

“Lesson Study: An Introduction”

Produced by Makoto Yoshida & Clea Fernandez
(20 min. video on CD-ROM)

Lesson Study: An Introduction

This CD-ROM is designed to present a general overview of the lesson study process and to answer questions frequently asked by American audiences when they hear about lesson study for the first time. Makoto Yoshida at Global Education Resources, L.L.C. created this CD-ROM in collaboration with Clea Fernandez at Teachers College, Columbia University. Footage and materials used for this videotape were collected by Makoto Yoshida at Tsutsi Elementary School in Hamamatsu, Japan as part of his dissertation work: “Lesson Study: A Case Study of a Japanese Approach to Improving Instruction Through School-Based Teacher Development” (1999).

Running Time: about 22 minutes

Video and Video Script ©2002 Makoto Yoshida & Clea Fernandez

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