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Talabalarning fazoviy tasavvurlarini oshirishda to'g'ri chiziq va ularning o'zaro vaziyatlariga oid masalalarning ahamiyati .

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Annotatsiya: Talabalarning fazoviy tushunchalarini takomillashtirishda to'g'ri chiziq izlari va ikki to'g'ri chiziqning interpozitsiya chizmalarining ahamiyati chizma geometriya fanining asosiy mavzusidir. Bu mavzu matematika, muhandislik va kundalik hayotning turli sohalarida hal qiluvchi ahamiyatga ega bo'lgan fazoviy munosabatlarni talabada tushunish va intuitivligini rivojlantirishga yordam beruvchi fundamental mavzusi hisoblanadi.

Kalit so'zlar. To'g'ri chiziqning izi, ikki parallel to'g'ri chiziq, Kesishuvchi ikki chiziq, Umumiy nuqta, Ayqash ikki to'g'ri chiziq, Raqobat nuqtalar.

Abstract: The importance of straight line traces and interposition drawings of two straight lines in improving students' spatial concepts is the main topic of drawing geometry. This topic is a fundamental topic that helps to develop the student's understanding and intuitiveness of spatial relationships, which are crucial in various fields of mathematics, engineering and everyday life.

Keywords. Trace of a straight line, two parallel straight lines, two intersecting lines, common point, intersection of two straight lines, competing points.

Аннотация: Важность прямых линий и рисунков пересечения двух прямых линий в улучшении пространственных представлений учащихся является основной темой рисования геометрии. Данная тема является фундаментальной, помогающей развить у учащихся понимание и интуицию пространственных отношений, которые имеют решающее значение в различных областях математики, техники и повседневной жизни.

Ключевые слова. След прямой, две параллельные прямые, две пересекающиеся линии, общая точка, пересечение двух прямых, конкурирующие точки.

Kirish. Insonning fazoviy tasavvurini oshirish uchun chizma geometriya fani va uning har bir mavzusi asos bo'lib xizmat qiladi. Chizma geometriyani har bir mavzusi to'g'ri chiziq bilan uzviy bog'liq desak xato bo'lmaydi.

1. Geometrik sezgining rivojlanishi

To'g'ri chiziq izlarini kuzatish talabalar fazoviy tasavvurlarida eng asosiy geometrik elementlardan biri – chiziq cheksizni cheksizligini tushunishga yordam beradi. Ushbu



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mashq ularning chiziqlik va yo'nalishni tasavvur qilish va tushunish qobiliyatini oshiradi. Ikki to'g'ri chiziqning interpozitsion chizmalari: talabalar kesishgan ikkita chiziq chizganda, ular burchaklarni yaratish va kesishish nuqtasini topish tushunchasini vizual tarzda o'rganishlari mumkin. Ushbu mashq geometrik figuralarning fazoviy bog'liqligini tushunishga yordam beradi. Bundan tashqari, kesishish burchagini yoki chiziqning nisbiy holatini o'zgartirib turli xil geometrik tushunchalar bilan tajriba o'tkazishlari mumkin.

2. Fazoviy fikrlash ko'nikmalarini oshirish

Vizual tahlil: Chizikli chizmalar bilan shug'ullanish talabalarga fazoviy munosabatlarni vizual ravishda tahlil qilish imkonini beradi. Bu mahorat arxitektura, muhandislik va san'at kabi sohalarda asosiy hisoblanadi. Chiziq bo'shliq yoki hajmni qanday aniqlashi mumkinligini tushunish o'quvchilarga atrofdagi uch o'lchovli dunyoni yaxshiroq yo'naltirish va izohlashga yordam beradi.

Masalan, to'g'ri chiziqda bo'lmagan nuqta orqali berilgan chiziqqa perpendikulyar chiziq o'tkazish o'quvchining tanqidiy va fazoviy fikrlash qobiliyatini oshiradi.

Masalan, Evklid geometriyasida teoremlarni isbotlashda parallel chiziq va ularga mos burchaklarni tushunish asosiy hisoblanadi.

To'g'ri chiziq: Fazoda joylashgan nuqtaning vaziyatini kesmaning 2 ta nuqtasi bilan aniqlanadi. To'g'ri chiziqning proyeksiyalari ham to'g'ri chiziq kesmasidan iborat bo'ladi. To'g'ri chiziq kesmasi fazoda berilgan bo'lsa uning proyeksiyalari orqali izlarini topamiz.

To'g'ri chiziqning izlari.

Agar to'g'ri chiziq H , V va W proyeksiyalar tekisliklari bilan kesishib nuqtalar hosil qilsa, u holda bu nuqtalar to'g'ri chiziqning izlari deyiladi.

To'g'ri chiziqning gorizont, frontal va profil izlari bo'lib, ularga quyidagicha ta'rif berish mumkin.

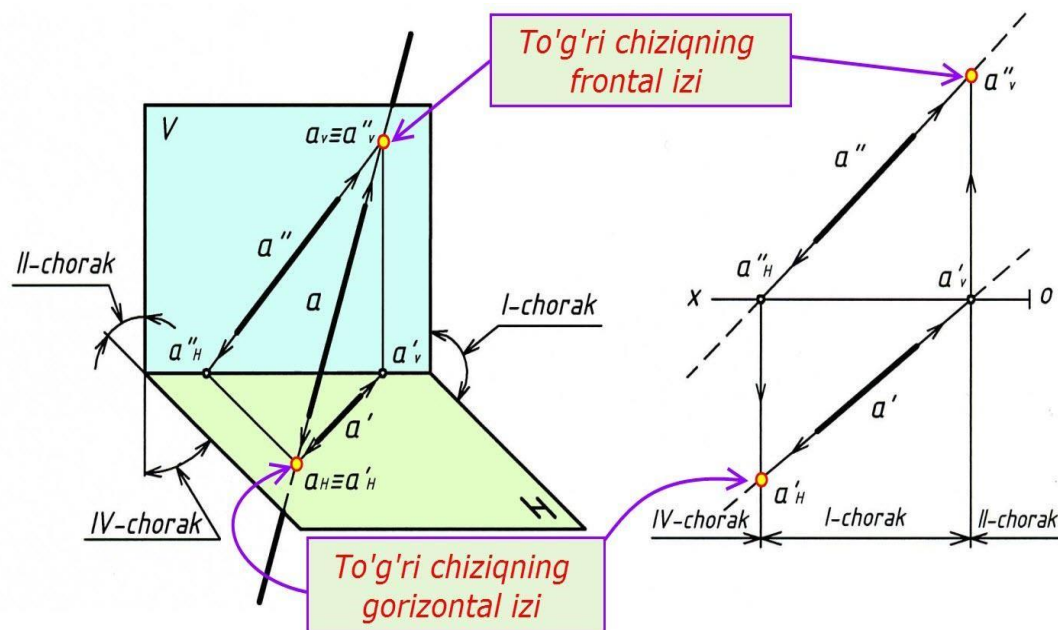
To'g'ri chiziqning gorizontali izi.

Agar a to'g'ri chiziq H -proyeksiyalar tekisligi bilan kesishib $a_H(a'_H, a''_H)$ -nuqta hosil qilsa, u holda ushbu $a_H(a'_H, a''_H)$ -nuqta a to'g'ri chiziqning **gorizontali izi** deyiladi.

$$a \cap H = a_H(a'_H, a''_H) \Rightarrow a'' \cap [Ox] = a''_H \wedge a'_H \in a'$$



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To'g'ri chiziqning frontal izi.

Agar a to'g'ri chiziq V - proyeksiyalar tekisligi bilan kesishib $aV(a'V, a''V)$ -nuqta hosil qilsa, u holda ushbu $aV(a'V, a''V)$ -nuqta a to'g'ri chiziqning **frontal izi** deyiladi.

$$a \cap V = a_v(a'_v, a''_v) \Rightarrow a'' \cap [ox] = a'_v \wedge a''_v \in a''.$$

To'g'ri chiziqning profil izi.

Agar a to'g'ri chiziq W -proyeksiyalar tekisligi bilan kesishib $aW(a'W, a''W, a'''W)$ -nuqta hosil qilsa, u holda ushbu $aW(a'W, a''W, a'''W)$ -nuqta a to'g'ri chiziqning profil izi deyiladi.

$$a \cap W = a_w(a'_w, a''_w, a'''_w)$$

Ikki to'g'ri chiziq

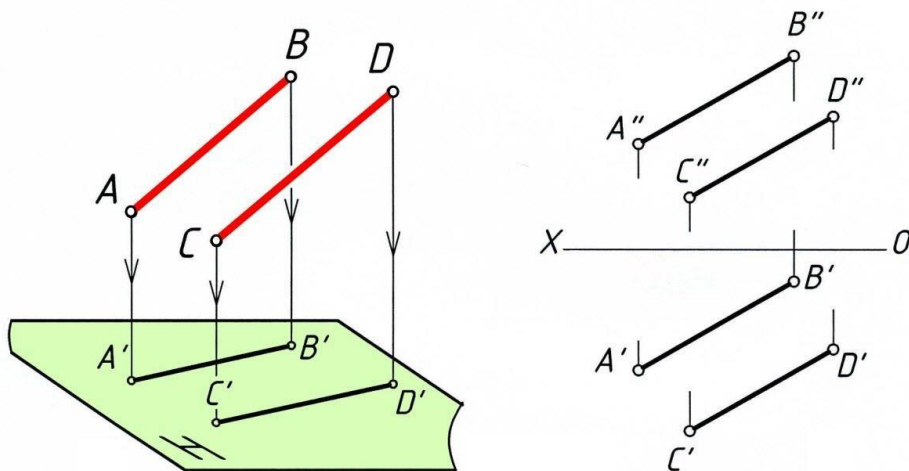
Fazoda ikki to'g'ri chiziq bir-biriga parallel bo'lishi, kesishishi va uchrashmas (ayqash) bo'lishi mumkin.

Parallel to'g'ri chiziqlar

Agar fazoda umumiy vaziyatdagi (AB) va (CD) to'g'ri chiziqlar o'zaro parallel bo'lsa, u holda, ularning hamma proyeksiyalari ham o'zaro parallel bo'ladi.



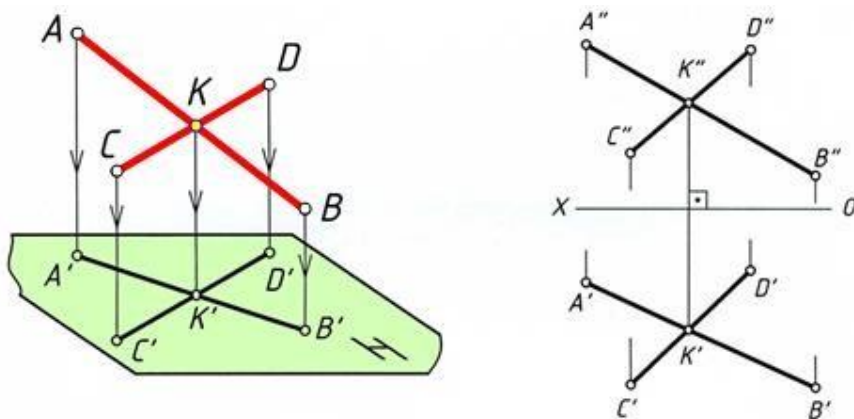
$$(AB) \parallel (CD) \Rightarrow (A'B') \parallel (C'D') \wedge (A''B'') \parallel (C''D'')$$



Kesishuvchi to'g'ri chiziqlar

Agar fazoda ikki (AB) va (CD) to'g'ri chiziqlar o'zaro kesishib bitta umumiy K nuqtaga ega bo'lsa, ushbu ikki to'g'ri chiziq kesishuvchi to'g'ri chiziqlar deyiladi. K nuqtaning K' -gorizontal va K'' -frontal proyeksiyalari bitta $[ox)$ -o'qqa perpendikulyar bo'lgan bog'lash chiziqda yotadi

$$(AB) \cap (CD) = K \Rightarrow [K'K''] \perp [ox)$$



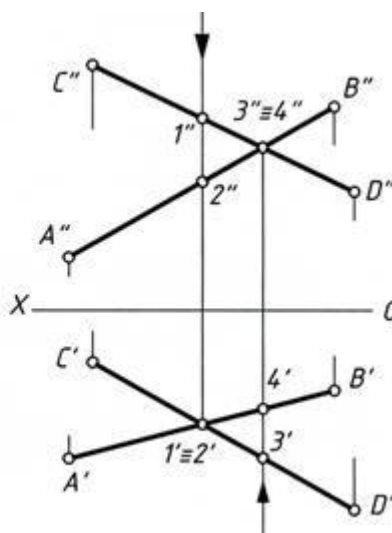
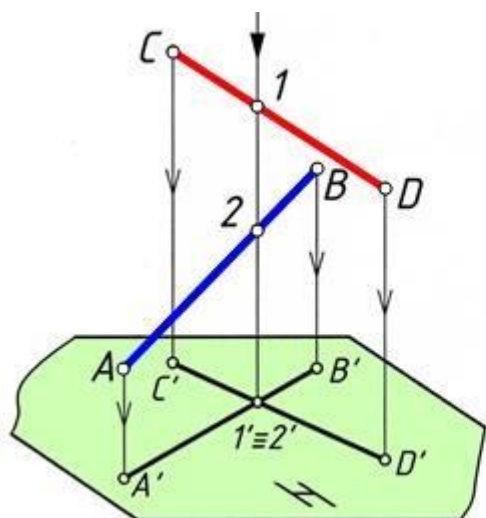
Ayqash to'g'ri chiziqlar



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Agar fazoda ikki (AB) va (CD) to'g'ri chiziqlar o'zaro parallel bo'lmasa va kesishmasa, u holda ushbu (AB) va (CD) to'g'ri chiziqlar uchrashmas yoki ayqash to'g'ri chiziqlar deyiladi

(AB)÷(CD).



Xulosa

To'g'ri chiziq va interpozitsiya chizmalari kabi mashqlarni o'quv sharoitlariga kiritish nafaqat talabalarga chiziqlar chizishni o'rgatish emas. Bu ularning ta'lim va kasbiy faoliyati davomida ularga yordam beradigan chizma geometriyani chuqurroq anglash va tushunishni rivojlantirish. Shunday qilib, bu mashqlar fazoviy tushunchalarga nisbatan kognitiv rivojlanishni kuchaytiradigan asosiy ko'nikmalarni shakllantirishda muhim rol o'ynaydi.

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